

# LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

Transport Assessment (TR-001-000)

Part 2: Baseline conditions

Traffic and transport

November 2013

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November 2013





## Department for Transport

High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

A report prepared for High Speed Two (HS2) Limited.

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# 5 Baseline Conditions

## 5.1 Introduction

5.1.1 This section of the Transport Assessment (TA) outlines the existing conditions of transport networks through which the Proposed Scheme is aligned. Due to the size and complexity of the overall route-wide study area of the TA, the description of baseline conditions has been split into Community Forum Areas (CFA) for ease of consumption. Reporting runs from south to north along the route, from CFA1 (Euston – Station and Approach) and ending with CFA26 (Washwood Heath to Curzon Street).

5.1.2 Existing transport network conditions have been identified using various methods including desk-top research, baseline surveys, site visits and engagement with local transport authorities for accident data and other traffic information. In the London and West Midlands metropolitan areas existing transport models, developed by local transport authorities, have also been used to determine baseline conditions.

5.1.3 All modes of transport have been considered along the proposed route. Where possible, the baseline conditions have been described from south to north within a CFA, unless otherwise stated.

5.1.4 Where the Proposed Scheme is situated within a tunnel, only relatively general transport baseline information has been reported for the area; except where construction and operational impacts are likely to be located, for which more detailed information is presented.

## 5.2 Baseline surveys

5.2.1 Baseline transport surveys have been undertaken along the entire route of the Proposed Scheme. Due to the diverse composition of local transport networks identified along the proposed route (particularly between metropolitan and rural areas) and the different levels of interventions of the Proposed Scheme, not all surveys outlined below have been required for the same duration or every CFA.

5.2.2 A programme of primary data collection was undertaken during summer 2012, with further additional surveys conducted until August 2013 as necessary, including some or all of the following depending on location and need:

- traffic surveys - manual classified counts (MMC), automatic traffic counts (ATC); queue length surveys and journey time surveys;
- non-motorised user surveys - public rights of way (PRoW) counts and cycle parking accumulation (within vicinity of existing or proposed stations); and
- station surveys - parking accumulation, taxi surveys (vehicle queues, passenger queues and occupancy counts), bus boarding and alighting, pedestrian counts



(main entrances/exits and accesses to platforms and ticket offices), private car drop-off/pick-up and interview surveys.

- 5.2.3 Traffic surveys have been undertaken to identify existing traffic demand, link volumes and to assist in model calibration. Non-motorised user surveys have been used to record existing numbers of pedestrians, cyclists and equestrians using PRow. Station surveys have been used to identify modal access and associated demand at existing stations (or similar stations to proposed stations).
- 5.2.4 The PRow surveys for leisure routes (including all rural PRow) were conducted during August 2012 at weekends, as peak demand for these routes is likely to be during these times. In addition, surveys were also conducted on weekdays during September 2012 on routes that may be used for purposes other than leisure and recreation to capture commuter movements.
- 5.2.5 Baseline data has also been obtained directly from local transport authorities, including: HA Traffic Flow Data System (TRADS); traffic count data; accident data and 'Trafficmaster' journey time information within the London metropolitan area.
- 5.2.6 Further details on the types and duration of surveys carried out are outlined within each CFA section and within baseline survey reports in Annex B.

## 5.3 Euston – Station and Approach (CFA1)

### Study area

- 5.3.1 This section provides an overview of the baseline traffic and transport conditions for the section of the Proposed Scheme that passes through CFA1.
- 5.3.2 It describes the transport infrastructure which will be affected either by the construction of the Proposed Scheme, or by the operation of the Proposed Scheme. For this area, the baseline conditions relate to the transport network affected by construction of the proposed extension to Euston station, the rail corridor and the operational impacts of the proposed station.
- 5.3.3 The scope of work and study area has been discussed with the transport authorities including LB of Camden (LBC) and TfL.
- 5.3.4 The road network study area for the study area includes the A501 Euston Road, A4200 Eversholt Street, A400 Hampstead Road and A4200 Upper Woburn Place among other local routes. The full study area within the CFA boundary can be seen in Figure 2, Volume 2 (CFA1 Report).

### Local land uses

- 5.3.5 The proposed route alignment through the study area passes through an urban area. The proposed extension to Euston station is located on land that predominately comprises residential use classes. The existing approach to the station is land owned by NR.

### Surveys

- 5.3.6 Transport surveys were undertaken in June 2012, September 2012 and October 2012. The survey locations are shown in the Euston baseline survey report in Annex B(i).

### Traffic surveys

- 5.3.7 The traffic surveys comprised of the following:
- MCC at highway junctions – surveys were undertaken on a weekday between 07:00 to 10:00 and 16:00 to 19:00, as well as on a Saturday between 08:00 and 16:00;
  - queue length surveys at signal controlled junctions – surveys were undertaken for the same time periods as the MCC;
  - traffic signal surveys including staging, green times, intergreens and cycle times at signal controlled junctions. Surveys were undertaken for the same time periods as the MCCs;
  - ATC on highway links across the study area. Wherever possible, ATC data was gathered for a continuous two week period to coincide with the date of the MCC;

- journey time surveys on key routes and sections of the highway network. Journey times were recorded from 07:00 to 10:00 and from 16:00 to 19:00 on a weekday, as well as between 08:00 and 16:00 on a Saturday; and
- vehicle origin and destination (OD) survey. Surveys captured strategic flows entering and exiting the network study area. All lanes were surveyed at the origin and destination locations using automatic number plate recognition (ANPR) cameras.

5.3.8 The traffic survey data showed that for the study area, the weekday AM peak hour was from 08:00 to 09:00 and the PM peak hour was from 17:00 to 18:00.

#### *Non-motorised user surveys*

5.3.9 Non-motorised user surveys were undertaken in August and September 2012 to establish the usage of roads and footways, assumed for this assessment to be PRow, used by pedestrian and cyclists in the area of the route. The surveys included pedestrian counts at a number of locations in the vicinity of Euston station and its surrounds. The surveys were carried out on a weekday for a 12-hour period between 07:00 and 19:00.

5.3.10 The surveys also captured the number of passengers entering or exiting the station with a bicycle and whether the bicycle was folded, capable of being folded or not capable of being folded.

5.3.11 Cycle parking accumulation surveys were also conducted at the facilities provided at Euston station and at a number of Barclays Cycle Hire docking stations within the vicinity of the station. The station surveys included cycle parking accumulation data recorded at the following locations:

- cycle parking located at the west side of the Euston station forecourt near the ticket office and 40 Melton Street;
- cycle parking located on the south side of the station forecourt in an 'L' shape around Nandos; and
- cycle parking located within the east side of the Euston station forecourt near Marks & Spencer and William Hill.

#### *Station surveys*

5.3.12 Euston station surveys were carried out on a weekday between 07:00 to 10:00 and 16:00 to 19:00 and between 08:00 and 16:00 on a Saturday. The surveys included:

- parking accumulation surveys at the long stay station car park;
- basement taxi facility survey, including:
  - taxi vehicle queue survey;
  - taxi passenger queue survey; and

- taxi and private vehicle occupancy counts.
- bus surveys at Euston bus station and surrounding streets. The data recorded included:
  - bus boarding and alighting surveys at Euston bus station;
  - the route number and the arrival and departure time of each bus at Euston bus station;
  - the approximate bus occupancy of each bus at Euston bus station; and
  - buses stopping on Eversholt Street, A501 Euston Road, A4200 Upper Woburn Place and A400 Hampstead Road.
- pedestrian counts (both directions) inside and at the entrances to the station. The surveys were carried out on a weekday between 07:00 and 10:00. The following locations were surveyed:
  - at station entrances from Euston Square, Melton Street, A4200 Eversholt Street and through retail (M&S);
  - the London Underground (LU) entrance to the station;
  - the entrance to the station from the taxi drop-off/car park area;
  - at all platforms; and
  - on the concourse, ticket offices and at retail units.
- interview surveys carried out on a weekday between 07:00 to 10:00 and 16:00 to 19:00 and between 08:00 and 16:00 on a Saturday. The interview surveys were undertaken at the following locations:
  - at all entrances to the station including the taxi drop-off/car park and the LU entrance ;
  - on the concourse; and
  - at the ticket office.
- the interview surveys obtained the following journey information:
  - journey origin (street name/postcode);
  - journey destination (street name/postcode);
  - purpose of journey (home, work, education, shopping, leisure etc.);
  - frequency of journey; and
  - mode of transport to and from the station.

## Public transport

- 5.3.13 The area in the vicinity of Euston station is well served by public transport, with rail (via Euston station), LU services (via Euston and Euston Square LU stations) and many bus routes operating in the area.
- 5.3.14 The Public Transport Accessibility Level (PTAL) rating for Euston station has been calculated using TfL's approved PTAL methodology. The PTAL calculation assumes a walk speed of 4.8kph and considers rail stations within a 12 minute walk (960m) of the site and bus stops within an eight minute walk (640m) accessible.
- 5.3.15 Using this methodology the PTAL is 6b or 'excellent' (1a is the lowest accessibility rating and 6b is the highest). The PTAL has been measured from the centre of the site.
- 5.3.16 The following sections describe the rail, LU and bus services in the area.

## Rail network

- 5.3.17 Euston station is the southern terminus of the West Coast Main Line (WCML) and the main rail gateway from London to the West Midlands, the North West, North Wales and parts of Scotland. The long-distance destinations with the most demand are Birmingham, Manchester, Liverpool and Glasgow. It also serves urban areas in the north-west of London out to Watford as well as commuter destinations such as Tring, Milton Keynes and Hemel Hempstead.
- 5.3.18 Existing passenger demand for national rail services at Euston station shows that in excess of 24,500 passengers alight from national rail services in the morning peak period (three-hours), with over 11,000 of those in the peak hour. A similar number return to rail services in the PM peak period, although the PM peak hour volume (9,630) is lower than the AM peak hour. This is due to passenger demand being more evenly spread across the PM peak period.
- 5.3.19 A description of the train services and frequencies at which they operate is provided in Table 5-1.

Table 5-1: Euston station train services and frequencies

TOC	Route description	Frequency (trains per hour)
Virgin Trains (platforms 1 to 7 and 12 to 18)	Euston station to Birmingham New Street (with at least 1 tph extended to Wolverhampton)	3 tph
	Euston station to Manchester Piccadilly (2 tph via Stoke-on-Trent and 1 tph via Crewe)	3 tph
	Euston station to Liverpool Lime Street via Stafford	1 tph
	Euston station to Chester, with some extended to along the North Wales Coast Line to Bangor and Holyhead for the connecting ferries to Dún Laoghaire and Dublin Port, or Wrexham General, all via Crewe	1 tph

TOC	Route description	Frequency (trains per hour)
	Euston station to Glasgow Central	1 tph
London Midland (platforms 8 to 11, 12 to 15 and 17)	Euston station to Tring	3 tph
	Euston station to Milton Keynes Central	4 tph
	Euston station to Northampton	3 tph
	Euston station to Birmingham New Street via Northampton	1 tph
	Euston station to Crewe via Northampton	1 tph
First ScotRail	Euston station to Aberdeen via Kirkcaldy and Dundee, Fort William via Dalmuir and Inverness via Stirling and Perth	1 train per day
	Euston station to Lowland sleeper service to Glasgow Central and Edinburgh Waverley via Carlisle.	1 train per day
London Overground (platform 9)	Euston station to Watford Junction via local stations in North West London	3 tph

5.3.20 The majority of Euston station is not currently equipped with automatic ticket gates, the exception to this are platforms eight to eleven, currently used by London Overground and London Midland services, which are gated. Revenue protection is therefore provided by a combination of methods, including on-train checks and manual ticket checks on entry to the platform.

5.3.21 Euston station currently experiences a range of congestion issues. Analysis of the PM peak identifies capacity in the rail concourse as being the area of weakest performance. This has been previously identified in NR's 'Network RUS – Stations' (August 2011). The RUS also identifies that the operation of this area requires management and control by station staff.

### London Underground

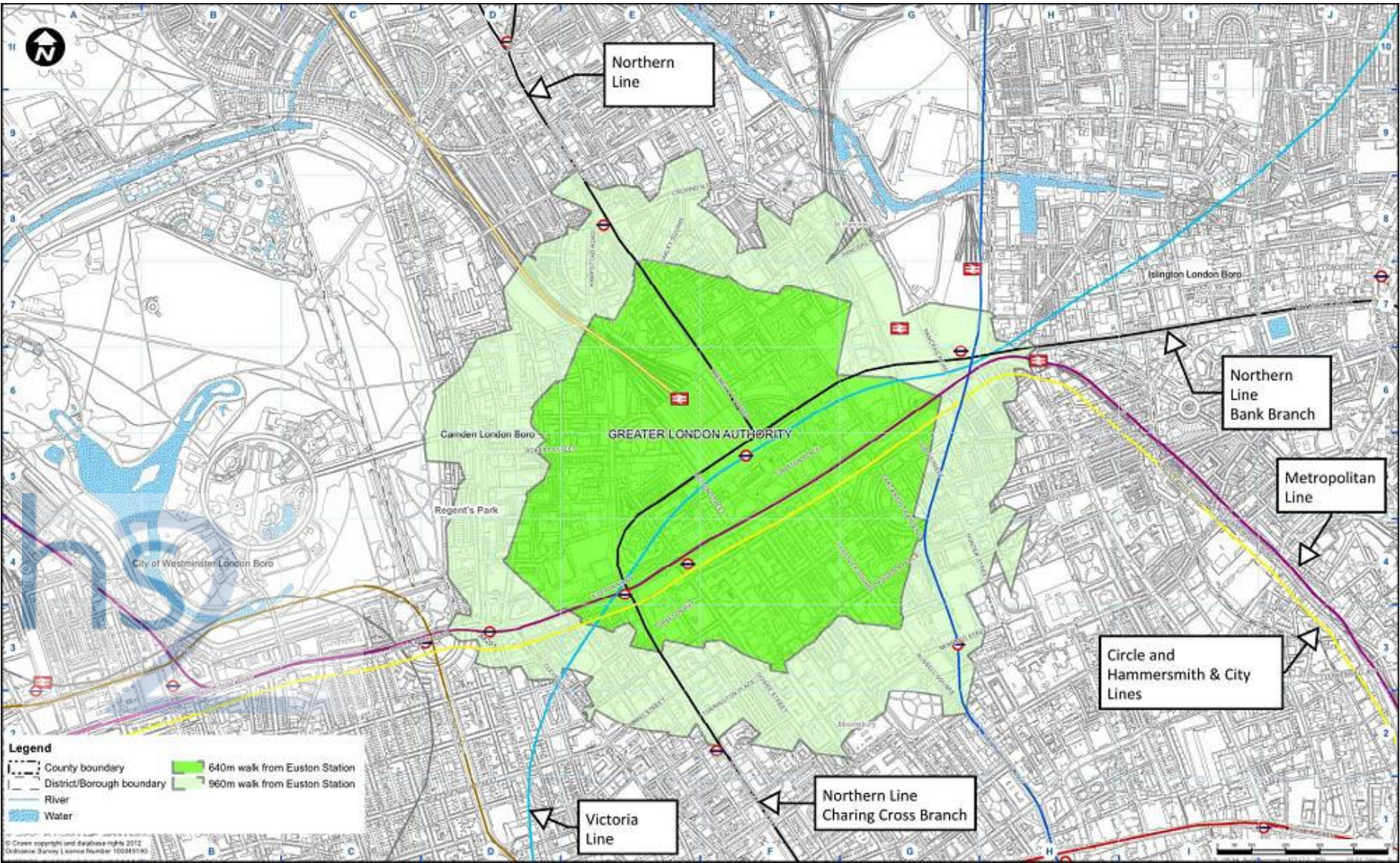
5.3.22 Euston LU station is served by the Victoria line and Northern lines (Bank and Charing Cross branches). The local rail network is shown on Figure 5-1.

5.3.23 The main entrance to the LU station is from within the National Rail concourse and there is secondary access via an underground footway from the mainline platforms eight to eleven. Euston underground station does not have access external to the National Rail station.

5.3.24 The surface-level movements outside the station include interchange with the bus services and also street level links with the Circle, Hammersmith & City and Metropolitan underground services at Euston Square LU station. These movements have to cross-at-grade at a busy signalised junction on A501 Euston Road.



Figure 5-1: LU services from Euston



- 5.3.25 LU services from Euston station are shown in Figure 5-1. There are services every two to three minutes in the AM peak period (i.e. 20 to 30 trains per hour) on the Victoria line and both branches of the Northern line.

Table 5-2: LU services and frequencies at Euston station

Line/direction	Number of trains	
	AM peak period (07:00 – 10:00)	AM peak hour (08:00 – 09:00)
Victoria SB	81	28
Victoria NB	77	29
Northern (Charing Cross branch) SB	54	20
Northern (Charing Cross branch) NB	58	20
Northern (Bank branch) SB	54	19
Northern (Bank branch) NB	58	21

Source: TfL tube timetables

- 5.3.26 TfL's 2007 Railplan model was used to identify crowding levels on LU. Analysis shows that some LU lines experience crowding levels above four passengers per square metre (ppsm) which is what TfL generally consider to be the limit of what is tolerable. The AM peak crowding levels in the baseline situation were identified:
- around four ppsm on the southbound Northern line (Bank branch) between Euston and King's Cross St. Pancras increasing to over five PPSM between King's Cross St. Pancras and Old Street;
  - over five ppsm on the southbound Victoria line between Highbury & Islington and Oxford Circus;
  - just over three ppsm on the Northern line (Charing Cross branch) between Camden Town and Warren Street; and
  - around two ppsm on the Circle, Hammersmith & City and Metropolitan lines between Great Portland Street and King's Cross St. Pancras.

- 5.3.27 Therefore, whilst the Northern line Bank branch and Victoria lines are very crowded and at levels that are above the limit that TfL consider tolerable, there is spare capacity on the Northern line Charing Cross branch and, in particular, on the Circle, Hammersmith & City and Metropolitan lines to and from Euston Square.

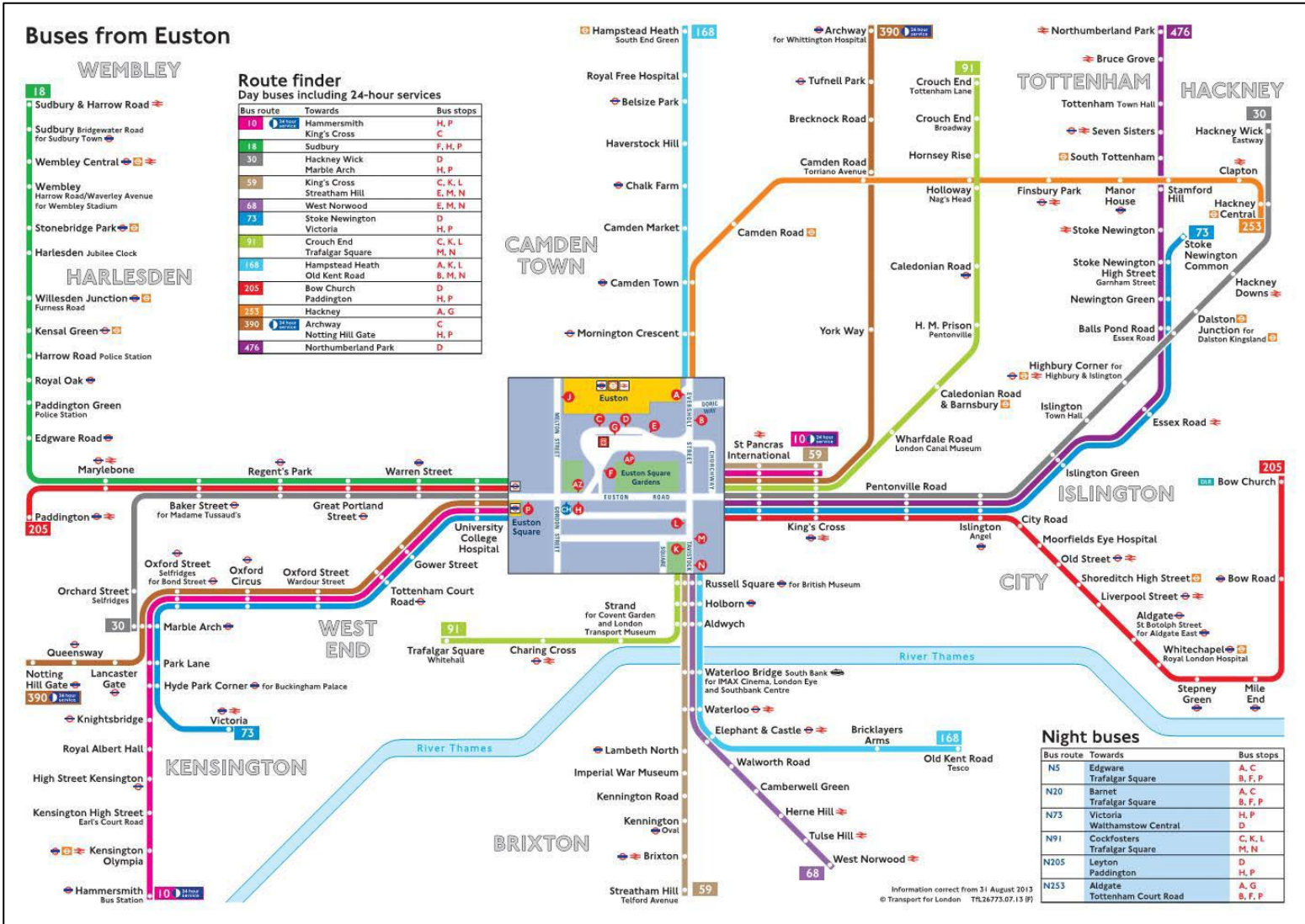
### *Local bus services*

- 5.3.28 This section describes the existing bus network which serves Euston station and its surrounds, describing the existing Euston bus station which is served by some of the routes. The local bus network, as well as the bus stops which serve Euston station, are shown in Figure 5-2. Information on bus routes and frequencies was obtained from TfL in September 2013.



- 5.3.29 The bus routes which serve Euston station can be divided into four groups:
- five west to east through bus routes, which run along A501 Euston Road;
  - one north to south through bus route, which runs along A4200 Eversholt Street/A4200 Upper Woburn Place;
  - two south to east through bus routes, which run from A4200 Upper Woburn Place in the south to A501 Euston Road in the east and vice versa; and
  - four terminating bus routes, which terminate at Euston bus station.
- 5.3.30 Terminating bus routes follow the routeing of the through bus routes but with the terminating bus stops located in Euston bus station.

Figure 5-2: Bus routes that serve Euston station and surrounds



Source: Transport for London

### North to south through bus route

- 5.3.31 Table 5-3 describes the north to south through bus route, which runs northbound and southbound along A4200 Eversholt Street. It is supplemented by two terminating bus routes (routes 68 and 253), as described in Table 5-5. The one north to south through bus route does not serve Euston bus station when running northbound or southbound and instead stops on A4200 Eversholt Street and A4200 Upper Woburn Place.

Table 5-3: Euston - north to south through bus route

Bus route	Direction	Frequency in AM peak hour	Bus stops served	Bus station served
168	Northbound towards Hampstead Heath	9 bph	A4200 Upper Woburn Place stop L A4200 Eversholt Street stop A	No
168	Southbound towards A2 Old Kent Road	9 bph	A4200 Eversholt Street stop B A4200 Upper Woburn Place stop M	No

### South to east through bus routes

- 5.3.32 Table 5-4 describes the two south to east through bus routes, which run from A4200 Upper Woburn Place in the south to A501 Euston Road in the east and vice versa. The two south to east through bus routes both serve Euston bus station when running eastbound, but only one of the two routes serves Euston bus station when running southbound, while the other route stops on A4200 Upper Woburn Place only.

Table 5-4: Euston - south to east through bus routes

Bus route	Direction	Frequency in AM peak hour	Bus stops served	Bus station served
59	Southbound towards Streatham Hill	9 bph	Bus station stop D A4200 Upper Woburn Place stop M	Yes
91	Southbound towards Trafalgar Square	9 bph	Upper Woburn Place stop M	No
59	Eastbound towards King's Cross	9 bph	A4200 Upper Woburn Place stop L Bus Station stop C	Yes
91	Eastbound towards Crouch End	9 bph	A4200 Upper Woburn Place stop L Bus Station stop C	Yes

### Terminating bus routes

- 5.3.33 Table 5-5 describes the four bus routes that terminate at Euston bus station.

Table 5-5: Euston - terminating bus routes

Bus route	Direction	Frequency in AM peak hour	Bus stops served	Bus station served
18	Westbound towards Sudbury Swan	20 bph	Bus Station stop F A501 Euston Road stop H	Yes
68	Southbound towards West Norwood	9 bph	Bus Station stop E A4200 Upper Woburn Place stop M	Yes
253	Northbound towards Hackney	12 bph	Bus Station stop AG A4200 Eversholt Street stop A	Yes
476	Eastbound towards Northumberland Park	7.5 bph	Bus Station stop D	Yes
18	Eastbound terminating at Euston	20 bph	A501 Euston Road stop AZ	No
68	Northbound terminating at Euston	9 bph	A4200 Upper Woburn Place stop L Bus Station stop AP	Yes
253	Southbound terminating at Euston	12 bph	A4200 Eversholt Street stop B Bus Station stop AP	Yes
476	Westbound terminating at Euston	7.5 bph	Bus Station stop AP	Yes

### A400 Hampstead Road bus routes

5.3.34 The northwest corner of the existing Euston station is approximately 100m from A400 Hampstead Road. The existing concourse is at the southern end of the station, which is 300m east of A400 Hampstead Road. Table 5-6 describes the five through bus routes that run along A400 Hampstead Road, with a total frequency of 49 bph in each direction.

Table 5-6: Euston - A400 Hampstead Road through bus routes

Bus route	Direction	Frequency in AM peak hour	Bus stops served	Bus station served
24	Northbound towards Hampstead Heath	10	Hampstead Road stop S	No
27	Northbound towards Chalk Farm	8	Hampstead Road stop T	No
29	Northbound towards Wood Green	12	Hampstead Road stop S	No
88	Northbound towards Camden Town	8	Hampstead Road stop T	No
134	Northbound towards North Finchley	12	Hampstead Road stop T	No
24	Southbound towards Pimlico	10	Hampstead Road stop R	No
27	Southbound towards Turnham Green	8	Hampstead Road stop U	No
29	Southbound towards Trafalgar Square	12	Hampstead Road stop R	No
88	Southbound towards Clapham Common	8	Hampstead Road stop U	No
134	Southbound towards Tottenham Court Road	12	Hampstead Road stop R	No

## Bus demand

- 5.3.35 Surveys of passengers boarding or alighting from buses in the Euston area were undertaken on Thursday 21 June 2012 and Saturday 23 June 2012. The number of bus boarders and alighters in the Euston station area and on bus route in the A400 Hampstead Road area are described in Table 5-7. The Euston station area includes:
- all bus stops in Euston bus station;
  - A501 Euston Road westbound stop H and eastbound terminating stop AZ;
  - A4200 Eversholt Street northbound stop A and southbound stop B; and
  - A4200 Upper Woburn Place northbound stop L and southbound stop M.
- 5.3.36 The A400 Hampstead Road area includes:
- A400 Hampstead Road 'Robert Street' northbound stop J and southbound stop; and
  - A400 Hampstead Road 'Silverdale' northbound stop B and southbound stop W.
- 5.3.37 The survey results for the Saturday were lower than the weekday, therefore the TA and design work has been based on weekday demand.

Table 5-7: Euston - 2012 baseline weekday bus boarding and alighting demand

Location	AM peak period (07:00 – 10:00)			PM peak period (16:00 – 19:00)		
Euston station area	3,315	2,330	5,645	4,060	3,205	7,265
A400 Hampstead Road area	690	540	1,230	685	645	1,325

- 5.3.38 Survey data shows that buses are well used by passengers in the Euston area, particularly during the AM and PM peak periods. TfL London Buses are able to increase or decrease bus frequencies to match passenger demand. There are instances of buses operating with spare capacity, but this is often vehicles that are just starting or finishing their route and will have higher passenger loads elsewhere on their route. Bus routes 18, 68, 253 and 476 are examples of routes which start at Euston and play an important role in providing bus capacity that is available to passengers exiting the station.

### *Coach services*

- 5.3.39 On A501 Euston Road, 'Euston station' westbound bus stop H also serves as coach stop CH and is marked by an additional flag and timetable. 'Euston station' eastbound bus stop AZ also serves as a coach stop. These coach stops are used by Green Line commuter coach 748 (one coach per day) and The Original Tour (three tour buses per day).

- 5.3.40 There is one existing coach bay on the west side of the railway station on Cardington Street, opposite the Hotel Ibis.
- 5.3.41 In addition, during disruption to train services, rail replacement coach services enter Euston station via a ramp from Barnby Street and stop in the wide space on platforms 2 and 3. Additionally, there are coach spaces provided for those with mobility impairments located in the basement level service area of Euston station with access from Melton Street and an exit on Eversholt Street.

### **Pedestrians, cyclists and equestrians**

- 5.3.42 Euston station and the surrounding area is well served by pedestrian and cycle facilities, as is typical of an urban area. The following sections identify the pedestrian and cycle facilities within the study area.

#### *Pedestrian facilities*

- 5.3.43 Euston station is a major terminus for commuters and travellers to and from central London. The major trip generators are located to the south, while smaller trip generators include small retailers and private housing to the east and west and public facilities to the south.
- 5.3.44 Roads adjacent to the station include Euston Road (south), Melton Street (west) and Eversholt Street (east). Other access streets that connect Euston station to the peripheral pedestrian network include Euston Street and Drummond Street. These streets have an east-west road alignment and intersect with Euston station on its western front.
- 5.3.45 Figure 5-3 and Figure 5-4 show the existing road and pedestrian network in the vicinity of Euston station.



Figure 5-3: Existing road and pedestrian network in vicinity of Euston station



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Figure 5-4: Euston - photographs showing footways along some of the local streets



A501 Euston Road (looking east)

Six lane major road with bus lanes on each side. Frequent bus stops are provided and generally the footways have a clear width of about 3m to 6m on both sides of the road.



Melton Street (looking south)

Two lane two-way road with parallel parking. Generally, the footway has a clear width of about 3m on the eastern side and 2m on the western side.



A4200 Eversholt Street (looking south)

Four lane major road south of Grafton Place and two lane two-way road with a bus lane north of Grafton Place. Generally, the footway has a clear width of 4m on the western side and 3m on the eastern side.



Euston Street (looking east)

Westbound only road. Generally the footways have a clear width of about 1m on both sides of the road.



Drummond Street (looking east)

Eastbound only road between Cobourg Street and Melton Street. Generally, the footways have a clear width of approximately 3m on the south side and 1m to 2m on the north side. On the north side the footway widens to a clear width of about 3m approaching Melton Street.

### **Pedestrian crossing assessment summary**

- 5.3.46 The aim of a pedestrian crossing comfort assessment is to understand if the infrastructure is comfortable for users in the context of vehicle traffic environment. This is important to understand as it will determine the level of compliance and the way pedestrians perceive connectivity in the area.
- 5.3.47 The main signalised pedestrian crossings are located at:
- A501 Euston Road junction with Melton Street and Gordon Street;
  - A501 Euston Road junction with bus station entrance;
  - A501 Euston Road junction with A4200 Eversholt Street and A4200 Upper Woburn Place; and
  - A4200 Eversholt Street junction with Grafton Place.



- 5.3.48 The assessment results show that during the existing peak hour, the majority of pedestrians are uncomfortable at crossings with pedestrian comfort level (PCL) results ranging from C+ to E on a scale of A (most comfortable) to E (least comfortable)<sup>1</sup>. Based on these findings, the crossings have a large degree of restricted movement and may lead to some users avoiding certain crossings.
- 5.3.49 The crossings which show PCL E include:
- A501 Euston Road junction with A4200 Eversholt Street and A4200 Upper Woburn Place on the east and north sides;
  - A501 Euston Road junction with Gordon Street on the east side; and
  - the west side of the A4200 Eversholt Street junction with Grafton Place.
- 5.3.50 At the junction of A501 Euston Road junction with Melton Street, the busiest crossing is the north side of A501 Euston Road at Melton Street which shows PCL E. Flow rates (in terms of people per metre per minute) are significantly higher than elsewhere and pure static analysis implies that these cannot be physically accommodated given signal times and crossing width.
- 5.3.51 Further observations and analysis has identified that a considerable number of pedestrians (up to 80%) cross on red signals and using more width than the demarcated crossing area. This is shown on Figure 5-5. In general, the PM peak results reflect the AM peak with tidal flows.

Figure 5-5: Pedestrians on A501 Euston Road crossing Melton Street on red signal



<sup>1</sup> TfL. 2010. Pedestrian Comfort Level Guidance. London: Transport for London.

### **Pedestrian footway assessment summary**

- 5.3.52 The purpose of the pedestrian footway comfort assessment is to understand the pedestrian experience as people walk down the street. A number of locations have been assessed to understand the level of comfort and how this may change owing to changes in street furniture or footway width.
- 5.3.53 The pedestrian comfort assessment for the Euston station area included main footways for:
- A501 Euston Road between North Gower Street and Dukes Road (north and south footways);
  - A4200 Eversholt Street between A501 Euston Road and Grafton Place (western footway);
  - Melton Street between A501 Euston Road and Drummond Street (eastern footway); and
  - Drummond Street between Melton Street and North Gower Street (north and south footways).
- 5.3.54 An assessment was undertaken for locations where the clear width changed along the footway length. For example, static objects like street furniture and areas where people are waiting, such as bus stops or cafes, all change the available width for pedestrian movement.
- 5.3.55 Similar to the pedestrian crossing assessment, the PCL ranges from A (most comfortable) to F (least comfortable) and is measured in people per metre minute (ppmm).
- 5.3.56 The analysis was undertaken using two-way footway pedestrian counts to reflect surveys undertaken in January and February 2013 and summarised in 'EAP Pedestrian Analysis' provided by WSP and Space Syntax. Based on these flows, the assessment results show the majority of streets in the vicinity of Euston station have footway widths that are comfortable for their users.
- 5.3.57 The main areas that may require mitigation measures (with results showing a PCL C- to F) are as follows:
- A501 Euston Road, east of Melton Street: two bus stops on the north and south side;
  - Euston Street; and
  - Drummond Street.
- 5.3.58 At all of these locations street furniture or obstructions reduce the effective width for pedestrians to less than minimum requirements recommended by TfL. The TfL calculation methodology automatically provides a score of F.

- 5.3.59 In the case of Euston Street and Drummond Street, additional observations indicate that many pedestrians walk in the road when there are no cars.

### **PERS audit**

- 5.3.60 The Pedestrian Environment Review System (PERS) Audit undertaken in January 2008 in the vicinity of Euston station by the Transport Research Laboratory (TRL), on behalf of TfL, has been reviewed. The PERS audit undertaken in February 2013 has also been reviewed. The February 2013 audit is not a full PERS audit but rather an update and summary of the same study area around Euston station.
- 5.3.61 Subsequent to these reviews, a PERS audit was undertaken to include an additional study area in the vicinity of Euston station.
- 5.3.62 Based on the study findings the following headline recommendations include:
- review the maintenance plan or schedule for pedestrian crossings with high usage;
  - review the effective width of the footways on A501 Euston Road and at the southern ends of A400 Hampstead Road and A4200 Eversholt Street and consider relocating or repositioning bus stops, aligning street furniture correctly and removing unnecessary obstructions;
  - review the existing provision and quality of dropped kerbs on minor roads linking to other minor roads; and
  - enhance legibility across the main roads on A501 Euston Road, A400 Hampstead Road and A4200 Eversholt Street to navigate users to the station.

### *Pedestrian flows*

- 5.3.63 Table 5-8 lists the survey locations and routes captured through the footway surveys. The pedestrian flows are also shown. The results identify the full bi-directional pedestrian movements at each location.

Table 5-8: Euston - summary of 12-hour footway surveys – entering junction/link

Site Description	North	East	South	West
Granby Terrace/Stanhope Street/Park Village East	575	435	444	n/a
Granby Terrace/A400 Hampstead Road	2,027	n/a	1,483	647
Harrington Street	355	n/a	430	n/a
A400 Hampstead Road/A400 Hampstead Road	1,142	117	849	n/a
Hampstead Gardens public footpath	166	89	76	202
St. James's Gardens public footpath (near Cardington Street)	6	7	42	62
Drummond Street/Cobourg Street	270	1,080	261	852
Stephenson Way	646	n/a	n/a	512

Site Description	North	East	South	West
Euston Square Gardens (near Melton Street)	10,126	n/a	8,970	n/a
Euston Square Gardens (near Eversholt Street)	971	n/a	268	n/a
Euston bus station/A501 Euston Road	1,538	1,189	407	1,328
Euston station frontage/A4200 Eversholt Street	1,277	n/a	1,443	n/a
Varndell Street	n/a	330	n/a	614
Mornington Street/Park Village East	416	358	407	n/a
Park Village East	225	n/a	300	n/a
Starcross Street	132	n/a	435	288
Mornington Street/Mornington Terrace	54	87	60	72

### *Cycle facilities*

#### **Cycle routes**

- 5.3.64 Figure 5-6 shows the local cycle network which serves Euston station and is based on information provided by the TfL 'Local Cycling Guides'.
- 5.3.65 A network of cycle routes called the London Cycle Network Plus (LCN+) exists in the London metropolitan area. A number of LCN+ routes use the street network surrounding Euston station, namely:
- LCN+ Route 6a is an 'unsigned route on quieter roads recommended by cyclists' on Cardington Street/Melton Street. This provides a route northward via Varndell Street towards Primrose Hill, or via Hampstead Road towards Camden Town. It also provides a route southward via Gordon Street to Bloomsbury, where it links to an east-west route with 'provision for cyclists adjacent to busy roads' on Torrington Place/Tavistock Place, LCN+ Route o;
  - LCN+ Route o runs east-west and is a two-way cycle track, it also forms part of LCN north-south route 6 which turns northward up Ossulston Street to the east of Euston station; and
  - LCN+ route 50 is an 'unsigned route on quieter roads recommended by cyclists' on Drummond Street. This provides a route westward to Regent's Park, where it links to a north-south 'route signed for cyclists that may be on busier roads' on Cornwall Terrace/York Gate, which runs in a north-south direction.
- 5.3.66 Drummond Street is one-way eastbound only, between Cobourg Street and Cardington Street. Short sections of 'unsigned route on quieter roads recommended by cyclists' on Euston Street and Cobourg Street allow cyclists to bypass the one-way section of Drummond Street.
- 5.3.67 There are no signed or recommended routes on Eversholt Street or Euston Road. The nearest signed route eastward is on Torrington Place/Tavistock Place.

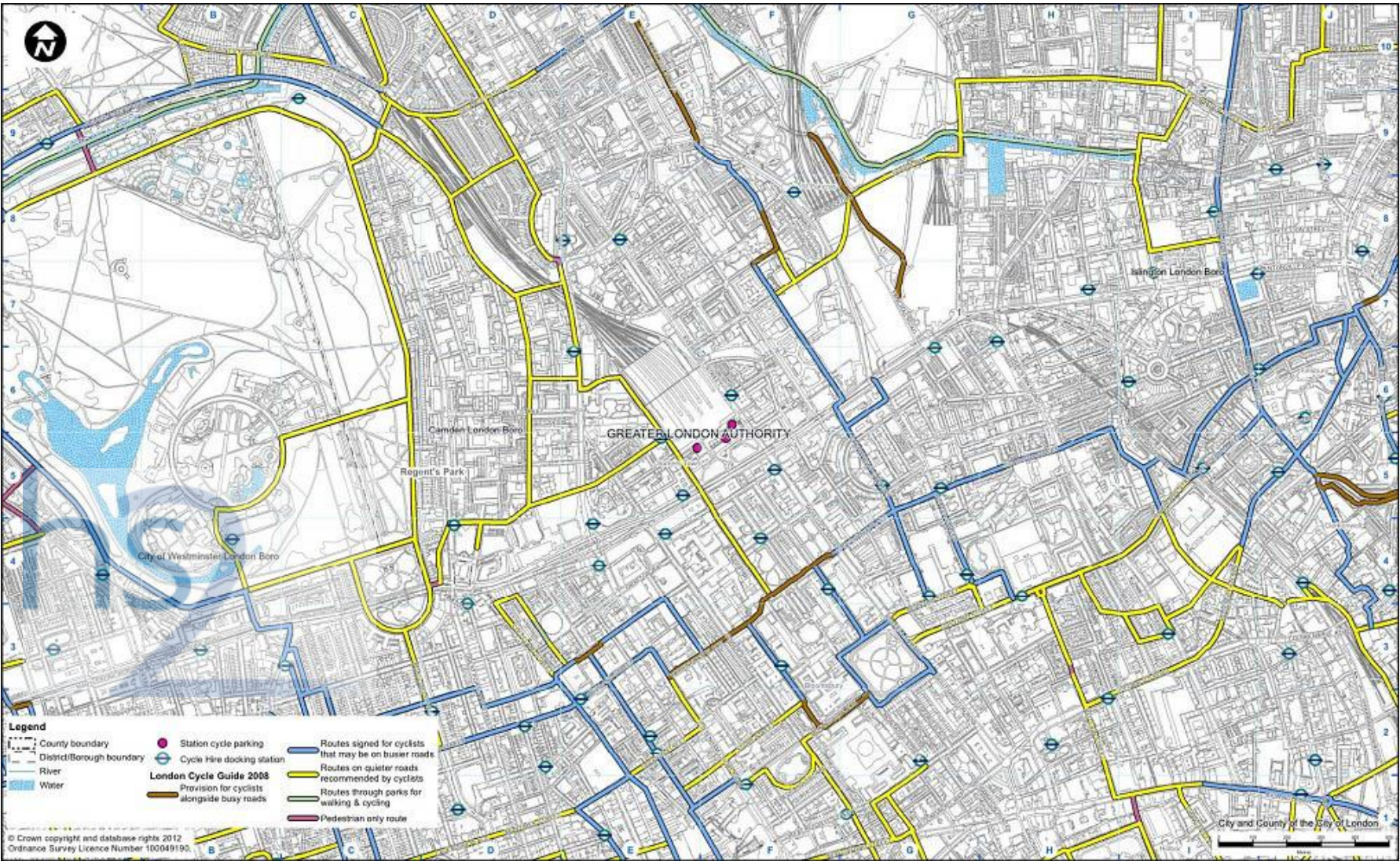
- 5.3.68 It is noted that the existing Euston station and its railway approach form a barrier between the cycle networks west and east of the station.

### **Cycle parking**

- 5.3.69 Figure 5-6 shows there are three cycle parking areas at the front of the existing Euston station, which use a mixture of Sheffield stand and new, covered two-tier cycle racks.
- 5.3.70 TfL's 'Euston Interchange Study: Final Pre-feasibility Report' (February 2010) states (at paragraph 4.6.4) that "in May 2009 cycle parking provision at Euston doubled to 286 spaces by the inclusion of double decked Josta two-tier racks. These racks were funded by TfL, with NR taking on responsibility for their on-going management and maintenance."
- 5.3.71 Surveys on Saturday 20 and Thursday 25 October 2012 found that the actual cycle parking provision has reduced to 234 spaces:
- 60 cycle parking spaces provided using Sheffield stand 'toast racks' on the west side of Euston station piazza near the ticket office, Sainsbury's supermarket and 40 Melton Street;
  - 124 cycle parking spaces provided using Josta two tier racks (88 spaces) and Sheffield stand 'toastracks' (36 spaces) near the centre of Euston station piazza in an 'L' shape around Nandos; and
  - 50 cycle parking spaces provided using Josta two tier racks on the east side of Euston station piazza near Marks & Spencer and William Hill/One Eversholt Street.



Figure 5-6: Euston - local cycle network and facilities



## London cycle hire provision

- 5.3.72 Figure 5-6 shows existing Barclays Cycle Hire docking stations in the Euston area. The nine docking stations nearest to Euston station are described in Table 5-9.

Table 5-9: Euston - Barclays Cycle Hire docking stations

Location	Number of Spaces
Drummond Street, Euston	28
A400 Hampstead Road (Cartmel), Euston	16
A400 Hampstead Road, Euston	54
A501 Euston Road, Euston	24
A400 Gower Place, Euston	49
Endsleigh Gardens, Euston	31
Doric Way, Somers Town	31
Taviton Street, Bloomsbury	30

### *Equestrian facilities*

- 5.3.73 There are no equestrian facilities in the local area.

## Parking and loading

### *Public parking at Euston station*

- 5.3.74 Within Euston station there are 216 public car parking spaces available in an underground parking facility. The parking accumulation survey on June 26 2012 recorded a low parking utilisation. The parking provision is shown in Table 5-10.

Table 5-10: Existing Euston station public parking provision

Parking type/user	Number of parking spaces
Blue badge parking	4
Public parking	212
Total public parking	216

### *Car hire company*

- 5.3.75 In discussions with station facilities staff, it was indicated that in the past the station car park used to be full every day but demand has reduced recently. Subsequently the car park operator has leased part of the underground car park to a car hire company. Currently a car hire firm leases the first floor of the underground car park which is estimated as 45 spaces. These spaces are marked specifically for use by the car hire company only.



### Operational parking

- 5.3.76 Within Euston station there are an estimated 326 operational parking spaces<sup>2</sup>. These spaces are provided for various services and functions. An estimated breakdown of the car parking numbers by user is provided below in Table 5-11. It should be noted that during site observations, only a small proportion of the available spaces were in use.

Table 5-11: Existing Euston station Operational Parking Provision

Parking type/user	Number of Parking Spaces
British Transport Police	6
TOCs	100
Other Service Companies	200
Special Event	20
Mobility Impaired Staff Parking	0
Total Operational	326

### Train Operating Companies (TOCs)

- 5.3.77 It is understood that, currently, legal agreements exist with each of the TOCs and include a provision for a number of on-site parking spaces. It is understood that these parking spaces are used by staff members mainly during off peak periods.

### British Transport Police

- 5.3.78 British Transport Police (BTP) currently has six marked parking spaces at Euston station. It is understood that on occasion, BTP request the use of a larger number of spaces for certain policing events.

### Other rail service companies

- 5.3.79 Within Euston station, several rail-related businesses currently operate, including:
- rail food services;
  - rail engineering companies; and
  - station facility services companies.
- 5.3.80 These companies currently have access to parking for their employees.

<sup>2</sup> Estimate based on September 2012 site visit records.



### Event parking

- 5.3.81 In discussions with station management staff, additional special event parking can be provided at the end of platform 18. This space is sometimes used for special events (e.g. a special train service), or used as overflow for the BTP as mentioned above.

### Mobility impaired staff parking

- 5.3.82 Currently there are no dedicated parking bays for mobility impaired staff parking within Euston station. Due to the over provision of parking on site, this is unlikely to create a problem and spaces should be available.

### Public on-street parking

- 5.3.83 Table 5-12 shows the parking facilities available on a number of roads within the vicinity of the station. The number of parking spaces recorded for each location is an approximation based upon site visit observations, as each vehicle space may not be individually marked.

Table 5-12: Euston - on-street parking locations

Location	Permit holder	Resident permit holder	Pay and display	Disabled	Motorcycle	Car club	Coach	Taxi	Loading
Melton Street						4			
Cardington Street			51			1	1	4	
Euston Street			10		9				2
Drummond Street (east of North Gower Street)	4		12		8				2
Cobourg Street		17							
Gordon Street (north of Endsleigh Gardens)									2
Barnby Street		3	6						
Mornington Crescent (south of Clarkson Row)		12	5			2			
Robert Street		22	35	1					
Stanhope Street (north of Robert Street)		18	5	1					
Mackworth Street		16							
Varndell Street		23	7	1					

Location	Permit holder	Resident permit holder	Pay and display	Disabled	Motorcycle	Car club	Coach	Taxi	Loading
Harrington Street (north of Mackworth Street)		10							
Granby Terrace	12	6	7						
Park Village East		73	17						
Mornington Terrace	15	71	5		6	2			
Lancing Street			4	1					1

## Taxi

- 5.3.84 The existing taxi rank is a basement level facility located at the southwest corner of Euston station. The basement level comprises a drop-off area (for use by taxis, private vehicles and mini-cabs) and a pick-up zone for use by taxis only.
- 5.3.85 Access to the basement level facilities is via a one-way only ramp down from Melton Street. To exit the basement level, there is an additional one-way only ramp up back onto Melton Street, which is located to the south of the entry ramp close to the junction of Melton Street with A501 Euston Road.
- 5.3.86 Table 5-13 shows the number of taxis entering and exiting the basement taxi facilities during the AM and PM peak hour and peak three hour periods. The surveyed occupancy rates are shown in Table 5-14.

Table 5-13: Euston - 2012 surveyed taxi flows entering and exiting the basement facilities

Taxi vehicle flow	Time period	Entry	Exit
AM peak 3-hour total	07:00 – 10:00	765	755
PM peak 3-hour total	16:00 – 19:00	847	877
AM Peak Hour	08:00 – 09:00	257	301

- 5.3.87 A total of 301 taxis exiting the basement facilities carried (to varying occupancy levels per taxi) 650 passengers during the AM peak hour (08:00 – 09:00).

Table 5-14: Euston - 2012 surveyed taxi occupancy rates

Taxi occupancy rate	Time period	Entry	Exit	Combined
AM peak 3-hour average	07:00 – 10:00	1.3	1.9	1.6
PM peak 3-hour average	16:00 – 19:00	1.9	1.7	1.8
AM peak hour average	08:00 – 09:00	1.3	2.1	1.7

5.3.88 For taxis travelling to Euston station, approximately 45% arrive from the west, approximately 50% arrive from the south and south-east and approximately 5% from elsewhere.

5.3.89 Taxis departing Euston station were recorded in the following directions:

- 40% south towards the City;
- 40% west towards the West End; and
- 20% north or east from the station.

## Highway network

### *London road network*

4.1.1 The strategic road network in London is made up of three categories of road:-

- Motorways that are owned and maintained by the HA;
- The Transport for London Road Network (TLRN) 'Red Routes' which are owned and maintained by TfL. This network is mostly made up of 'A' roads. The TLRN is made up of approximately 5% of London's road network, but carries approximately one third (33%) of all London's traffic. In some instances 'Red Route' controls extend onto adjacent side roads and, in these cases, TfL is the Traffic Authority whilst the London Borough is the Highway Authority. It should also be noted that TfL are responsible for all traffic signals in London, regardless of which category of road they are upon; and
- The Strategic Road Network (SRN) generally consists of the remaining 'A' roads in London, carrying the main traffic flows and longer distance movements. These roads are owned and maintained by the London Boroughs, but any proposed changes in layout or operation that may impact upon the performance of the road must be referred to TfL for approval.

5.3.90 The local road network is owned and maintained by the London Boroughs.

5.3.91 The following section describes the roads within the study area. Euston station is well connected to the TLRN and the SRN, with the A501 Euston Road forming a southern boundary to the station. The key junctions forming access to the station are:

- A501 Euston Road/Melton Street/Gordon Street;
- A501 Euston Road/A4200 Upper Woburn Place/Euston Square (A4200 Eversholt Street);
- A501 Euston Road/Grafton Place;
- A501 Euston Road/Churchway/Dukes Road;
- A400 Hampstead Road/Cardington Street; and
- A400 Hampstead Road/Drummond Street.

## *Transport for London road network*

### **A501 Euston Road**

- 5.3.92 The A501 Euston Road runs in an east-west direction from A5 Edgware Road to the west and A5201 Old Street to the east and forms the southern boundary of the Euston station site. A501 Euston Road is part of the TLRN and is a red route and has bus lanes along section of its length in both directions.
- 5.3.93 To the west of Euston station lies the major junction of A501 Euston Road with A400 Tottenham Court Road and A400 Hampstead Road, known as Euston Circus. This includes a grade-separated underpass for ahead movements (in both directions) along A501 Euston Road with on and off slip roads road provided in both directions. To the east of Euston station, the first junction is with Euston Square (A4200 Eversholt Street) and A4200 Upper Woburn Place.
- 5.3.94 Adjacent to Euston station the road provides two traffic lanes and one bus lane in both directions and A501 Euston Road has a speed limit of 30mph.
- 5.3.95 The A501 Euston Road operates with varying traffic conditions from day to day. On occasions, A501 Euston Road experiences congestion, particularly during the AM and PM peak hours.

### **A400 Hampstead Road**

- 5.3.96 A400 Hampstead Road runs north-south from A501 Euston Road at its southern end to A400 Camden High Street at its northern end. The road is part of the TLRN, carries various TfL bus services and is a designated red route.
- 5.3.97 A400 Hampstead Road forms a junction with A400 Tottenham Court Road and A501 Euston Road at Euston Circus. A400 Hampstead Road has a southbound bus lane north of the signalised junction with Drummond Street.
- 5.3.98 Generally, A400 Hampstead Road has two lanes in each direction, although this varies across its length.
- 5.3.99 Across A400 Hampstead Road bridge, the road widens to two general traffic lanes and a bus lane in each direction. The road narrows to one lane in each direction just south of Cardington Street.
- 5.3.100 The speed limit along the entire length of A400 Hampstead Road is 30mph.
- 5.3.101 A400 Hampstead Road generally experiences free flow traffic conditions, with the junctions along its length operating within capacity during the AM and PM peak hours. Localised queuing and congestion is experienced at some junctions and pedestrian crossings at times, but this tends to be of a short duration with little impact on other junctions along A400 Hampstead Road.

### *Strategic road network*

- 5.3.102 This section describes the roads in the vicinity of Euston station that are part of the strategic road network (SRN). All roads described have a speed limit of 30mph.

#### **A4200 Eversholt Street**

- 5.3.103 A4200 Eversholt Street is a north-south road running between A501 Euston Road to the south and Harrington Square to the north. A4200 Eversholt Street forms the eastern boundary to Euston station, with a mix of retail and residential land uses along the eastern side of the street.
- 5.3.104 A4200 Eversholt Street is generally three lanes wide with one lane in each direction for general traffic and a third lane southbound that operates as a bus lane during peak times or for on-street parking. This varies by section and by direction. The road accommodates a number of TfL bus services.
- 5.3.105 At its southern end, A4200 Eversholt Street turns into Euston Square (east) for approximately 60 metres between the junction with Grafton Place and A501 Euston Road.
- 5.3.106 There are a number of controlled junctions and crossings along A4200 Eversholt Street, including traffic signals at its junctions with Euston Road, Grafton Place and A400 Oakley Square. There are also signalised pedestrian crossings near Doric Way and Aldenham Street and a zebra crossing near Phoenix Road. Other priority junctions exist along the road with a number of local residential roads.
- 5.3.107 Traffic flows along A4200 Eversholt Street generally experience free flow conditions. However, instances of localised queuing and congestion can be experienced at pedestrian crossings and junctions during the AM and PM peak hours. This is particularly evident along the southbound approach to the junction of A4200 Eversholt Street with Grafton Way and Euston bus station.

#### **A4200 Upper Woburn Place**

- 5.3.108 A4200 Upper Woburn Place is a north-south road that extends south from the junction with A501 Euston Road and Euston Square (A4200 Eversholt Street).
- 5.3.109 At its widest point, A4200 Upper Woburn Place has three lanes with two lanes (one bus lane and one general traffic lane) in the southbound direction and one lane (for general traffic) in the northbound direction. South of Endsleigh Place, A4200 Upper Woburn Place is typically one general traffic lane in each direction.
- 5.3.110 A4200 Upper Woburn Place carries TfL bus services in both directions. The road includes a number of priority junctions and zebra crossings as well as signalised junctions with A501 Euston Road and Tavistock Square.

- 5.3.111 A4200 Upper Woburn Place generally experiences free flow traffic conditions. However, the approach to the junction with A501 Euston Road can experience some queuing during the AM and PM peak hours with limited spare capacity.

#### **A400 Tottenham Court Road**

- 5.3.112 A400 Tottenham Court Road is a one-way northbound road, typically with three general traffic lanes, with additional bus lane and facilities along parts of the road. The road supports multiple bus services.
- 5.3.113 A400 Tottenham Court Road supports a significant retail, employment and public transport function and consequently is subject to high pedestrian movements. A400 Tottenham Court Road has several signalised crossing facilities to support these movements.
- 5.3.114 A400 Tottenham Court Road forms a junction with A501 Euston Road and A400 Hampstead Road at Euston Circus.
- 5.3.115 Traffic flows along A400 Tottenham Court Road are high and with traffic typically free flowing between junctions during the AM and PM peak hours. Localised queuing at pedestrian crossings and at junctions tends to occur during the AM and PM peak hours, particularly on the approach to Euston Circus.

#### **A400 Gower Street**

- 5.3.116 A400 Gower Street is a one-way southbound road, typically with three lanes. A bus lane is provided to the south of the pedestrian crossing which is located just south of Gower Place. The road supports multiple bus services.
- 5.3.117 At the northern end, A400 Gower Street supports a significant amount of educational uses (University College London) and hospital facilities (University College London Hospital). As such, numerous pedestrian crossings are provided along its length to support these uses.
- 5.3.118 At its northern extent, A400 Gower Street forms a junction with A501 Euston Road. Pedestrian crossing facilities are also provided at this junction, allowing safe access for pedestrians to Euston Square LU station.
- 5.3.119 Typically, traffic flows along A400 Gower Street are high. However, traffic generally experiences free flow conditions, although short periods of localised queuing does occur at junctions and pedestrian crossings.

#### ***Local road network***

- 5.3.120 This section describes the local roads in the vicinity of Euston station. All roads described in this section have a speed limit of 30mph unless otherwise stated.

### **Gordon Street**

- 5.3.121 Gordon Street runs north-south between A501 Euston Road to the north and Gordon Square to the south. Gordon Street is a borough road maintained by LBC.
- 5.3.122 At its widest point (at A501 Euston Road), there are two northbound lanes and one southbound lane. South of Endsleigh Gardens, the road narrows to one lane in each direction with space for parking on both sides. Gordon Street contains a number of zebra crossings and priority junctions, with the only signalised junction being with A501 Euston Road.
- 5.3.123 Gordon Street typically experiences free flow traffic conditions in both directions during the AM and PM peak hours.

### **Melton Street/Cardington Street**

- 5.3.124 Melton Street and Cardington Street are north-south running streets that extend along the western edge of Euston station. At its north-end, Cardington Street turns to an east-west alignment and connects with A400 Hampstead Road at a signalised junction.
- 5.3.125 Cardington Street has one general traffic lane in each direction and traffic calming speed humps along much of its length. Parking is provided on both sides of the road. The junction of Cardington Street and Drummond Street is a priority junction.
- 5.3.126 South of Drummond Street, Cardington Street becomes Melton Street. Melton Street includes priority junctions with Euston Street and entrances to Euston station (taxi rank) and a zebra crossing. The road has two general traffic lanes in each direction, with a dedicated turning lane provided at the vehicle entrance to Euston station.
- 5.3.127 At its southern end, Melton Street turns into Euston Square (west) for approximately 40 metres alongside Euston Square Gardens.
- 5.3.128 Melton Street and Cardington Street are borough roads maintained by LBC.
- 5.3.129 The traffic flow on Melton Street comprises a large number of taxis travelling to and from Euston station. The movement of taxis to and from the station often results in queuing from the taxi facility backing onto the southern section of Melton Street, including during the AM and PM peak hour.
- 5.3.130 Cardington Street experiences lighter traffic flow when compared with Melton Street and traffic conditions are typically free flowing.

### **Drummond Street**

- 5.3.131 Drummond Street runs in an east-west direction between Melton Street and Stanhope Street. The road is a predominantly a local two-way road with one lane in each direction and parking on both sides. The road includes a number of priority junctions with other local roads and traffic calming along much of its length. Drummond Street becomes one-way eastbound between Cobourg Street and Melton Street.
- 5.3.132 Drummond Street is lightly trafficked with free flow conditions experienced during the AM and PM peak hours.

### **Euston Street**

- 5.3.133 Euston Street runs in a westbound direction between Melton Street and North Gower Street. The road is predominantly a local one-way road with parking on one side. The road includes a number of priority junctions with other local roads.

### **Starcross Street**

- 5.3.134 Starcross Street runs in an east west direction between North Gower Street and Cobourg Street. The road is a local two-way road with parking on both sides. The road serves the Maria Fidelis Covenant School and includes some traffic calming features and parking controls.

### **Stephenson Way**

- 5.3.135 Stephenson Way runs in an eastbound direction, turning north between North Gower Street and Euston Street. The road is a local one-way road with parking on one side and limited pedestrian footpath width. The road includes a number of vehicle access points to buildings. The speed limit on the road is 30mph.

### **Granby Terrace**

- 5.3.136 Granby Terrace is a one-way eastbound road connecting Park Village East and A400 Hampstead Road. The bridge section of Granby Terrace has one central general traffic lane flaring to two lanes at the junction with A400 Hampstead Road. Parking is provided on either side as well as two metre (approximate) footways on either side of the road. The road has a speed limit of 32kph (20mph) and provides road access over the Euston station lines.

### **Mornington Street**

- 5.3.137 Mornington Street is a two-way road with an east-west alignment connecting Park Village East to Mornington Terrace, Albert Street and Arlington Road. The bridge section of Mornington Street has one general traffic lane in each direction with two metre (approximate) footways on either side of the road. The speed limit on the road is 32kph (20mph) and provides road access over the Euston station lines.



## Park Village East

- 5.3.138 Park Village East is one-way in a north to south direction from Parkway to Mornington Street and two-way from Mornington Street to Stanhope Street. Between A4201 Parkway and Mornington Street, one wide lane is provided and parking is permitted on the eastern side. One lane is provided in each direction between Mornington Street and Stanhope Street. Parking is permitted on the western side of the street along this section. The speed limit on Park Village East is 32kph (20mph).

### Baseline conditions

- 5.3.139 2012 baseline conditions on the roads in the vicinity of the Proposed Scheme are outlined in Table 5-15 below.

Table 5-15: Euston – Station and Approach AM and PM peak 2012 baseline flows

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
North of Euston Road					
Outer Circle (between Park Square East and Chester Road)	Northbound	268	0	561	0
	Southbound	190	0	216	0
A4201 Albany Street (between Robert Street and Longford Street)	Northbound	308	26	295	6
	Southbound	276	16	356	5
Stanhope Street (between Longford Street and Robert Street)	Northbound	64	3	27	1
	Southbound	315	6	317	5
A400 Hampstead Road (between Drummond Street and Robert Street)	Northbound	321	19	635	15
	Southbound	656	47	351	6
Cardington Street (north of Drummond Street)	Northbound	117	4	192	2
	Southbound	277	11	254	5
New Cobourg Street (north of Starcross Street)	Northbound	-	-	-	-
	Southbound	-	-	-	-
A4200 Eversholt St (between Phoenix Road and Polygon Road)	Northbound	225	13	311	6
	Southbound	277	15	297	6
Chalton Street (between Euston Road and Phoenix Road)	Northbound	66	3	99	1
	Southbound	50	2	5	0
Midland Road (between Brill Place and Euston Road)	Southbound	577	25	547	7

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
A5202 Pancras Road (between Euston Road and Goods Way)	Northbound	243	10	185	2
	Southbound	214	10	241	4
A5203 York Way between Euston Road and Caledonia Street	Northbound	559	28	801	18
<b>South of Euston Road</b>					
A4201 Portland Place (between Devonshire Street and Park Crescent)	Northbound	273	5	238	0
	Southbound	421	14	545	9
B506 Great Portland Street (between Park Crescent Mews East and Devonshire Street)	Southbound	258	13	385	4
Cleveland Street (between Greenwell Street and Clipstone Street)	Southbound	170	7	144	1
A400 Tottenham Court Road (between Grafton Way and Warren Street)	Southbound	876	68	991	19
A400 Gower Street (between Grafton Way and Gower Place)	Southbound	711	27	566	4
Gordon Street (between Endsleigh Gardens and Euston Road)	Northbound	317	40	423	9
	Southbound	265	10	194	3
A4200 Upper Woburn Place (between Endsleigh Gardens and Euston Road)	Northbound	353	15	327	6
	Southbound	608	18	540	7
B504 Judd Street (between Bidborough Street and Euston Road)	Northbound	166	18	145	2
	Southbound	494	24	288	7
A501 Gray's Inn Road (east of Birkenhead Street)	Northbound	1,704	86	1,630	29
<b>A501 Euston Road</b>					
A501 Euston Road between Euston Circus and Melton Street	Eastbound	1,850	97	1,162	37
	Westbound	1,666	114	1,609	32
A501 Euston Road between Melton Street and A4200 Upper Woburn Place	Eastbound	1,630	82	1,378	36
	Westbound	1,520	87	1,372	29
A501 Euston Road between A4200 Upper Woburn Place and Churchway	Eastbound	1,334	74	1,133	33
	Westbound	1,499	81	1,408	26

5.3.140

The operation of the six key junctions which form the main access routes from the local road network to Euston station have been analysed for the 2012 baseline conditions and the results are summarised below.

- 5.3.141 The modelling results for the junction south of A501 Euston Road with Melton Street and Gordon Street, A4200 Upper Woburn Place and Euston Square, Churchway and Dukes Road and the junction of A4200 Eversholt Street with Grafton Place and the Euston bus station have been extracted from the TRANSYT model and presented in below. The results are as terms of Degree of Saturation (DoS) and Mean Maximum Queue (MMQ) measured in Passenger Car Units (PCU).

### **A501 Euston Road junction with Melton Street and Gordon Street**

- 5.3.142 Table 5-16 shows the existing operation of the A501 Euston Road junction with Melton Street and Gordon Street, during the weekday AM and PM peak hours.

Table 5-16: 2012 baseline - A501 Euston Road/Melton Street/Gordon Street peak hour flows, DoS and queue lengths (PCU)

Junction approach – movement	AM peak hour (08:00 – 09:00)			PM peak hour (17:00 – 18:00)		
	Flow	DoS	MMQ	Flow	DoS	MMQ
Melton Street – left/ahead	335	36%	5	292	35%	5
Melton Street – ahead/right	253	46%	6	251	48%	6
Euston Road east – left/ahead	852	71%	22	1,085	78%	13
Euston Road east bus lane – ahead	395	63%	9	336	47%	4
Gordon Street – left/ahead	363	55%	9	474	66%	11
Euston Road west bus lane – left/ahead	469	75%	12	640	87%	19
Euston Road west – left/ahead	1,258	87%	34	1,176	70%	28

- 5.3.143 Table 5-16 shows that the longest queues occur on the A501 Euston Road west approach to the junction, during the AM and PM peak hours. The predicted maximum queue lengths is split over two lanes and can be accommodated within the available road space, although blocking back does occur on occasions.

### **A501 Euston Road junction with A4200 Upper Woburn Place and Euston Square**

- 5.3.144 Table 5-17 shows the existing operation of the A501 Euston Road junction with A4200 Upper Woburn Place and Euston Square (A4200 Eversholt Street), in the weekday AM and PM peak hour.

Table 5-17: 2012 baseline - A501 Euston Road/A4200 Upper Woburn Place/Euston Square peak hour flow, DoS and queue lengths (PCU)

Junction approach – movement	AM peak hour (08:00 – 09:00)			PM peak hour (17:00 – 18:00)		
	Flow	DoS	MMQ	Flow	DoS	MMQ
Euston Square – ahead	265	56%	8	234	47%	5
Euston Road east – ahead	801	68%	20	954	64%	21
Euston Road east bus lane – left/ahead	539	90%	17	500	67%	12
Upper Woburn Place – left/ahead	408	80%	10	450	87%	13
Euston Road west – ahead	1,326	52%	36	1,484	59%	17
Euston Road west – right	290	57%	8	212	58%	6

- 5.3.145 The table shows that during the AM peak hour, the longest queue occurs on the A501 Euston Road west approach to the junction. The predicted maximum queue lengths can be accommodated within the available storage without affecting upstream junctions. During the PM peak hour, the largest queue occurs on the A501 Euston Road east approach to the junction. Again, the predicted queue can be accommodated across the two lanes on this approach to the junction.

### A501 Euston Road junction with Churchway and Dukes Road

- 5.3.146 Table 5-18 shows the existing operation of the Euston Road junction with Churchway and Dukes Road in the weekday AM and PM peak hour.

Table 5-18: 2012 baseline - A501 Euston Road/Churchway/Dukes Road peak hour flow, DoS and queue lengths (PCU)

Junction approach – movement	AM peak hour (08:00 – 09:00)			PM peak hour (17:00 – 18:00)		
	Flow	DoS	MMQ	Flow	DoS	MMQ
Churchway – left/ahead/right	235	96%	12	236	90%	10
Euston Road east – ahead/right	406	84%	11	369	69%	9
Euston Road east – left/ahead	587	45%	4	779	57%	8
Euston Road east bus lane – ahead	409	30%	3	432	32%	4
Dukes Road – left/ahead/right	30	4%	0	50	13%	1
Euston Road West – left/ahead	1,334	48%	12	1,475	78%	14

- 5.3.147 Table 5-18 shows that the longest queues occur on the A501 Euston Road west approach to the junction, during both the AM and PM peak hours. The predicted maximum queue lengths can be accommodated on Euston Road without affecting upstream junctions.

### **A4200 Eversholt Street junction with Grafton Place and Euston Bus Station**

- 5.3.148 Table 5-19 shows the existing operation of the Eversholt Street junction with Grafton Place and Euston bus station in the weekday AM and PM peak hour.

Table 5-19: 2012 baseline - A4200 Eversholt Street/Grafton Place/Euston bus station peak hour, flows, DoS and queue results (PCU)

Junction approach - movement	AM peak hour (08:00 - 09:00)			PM peak hour (17:00 - 18:00)		
	Flow	DoS	MMQ	Flow	DoS	MMQ
Eversholt Street - left/ahead/right	301	92%	12	266	94%	14
Grafton Place - left/ahead/right	177	90%	8	196	98%	11
Euston Square - left/ahead/right	335	65%	10	346	72%	7
Euston Bus station - left/ahead/right	202	42%	5	192	43%	5

- 5.3.149 Table 5-19 shows that the longest queues occur on the Eversholt Street approach to the junction, during both the AM and PM peak hours. The predicted maximum queue lengths can be accommodated on Eversholt Street without affecting upstream junctions.

### **A400 Hampstead Road junction with Drummond Street**

- 5.3.150 Table 5-20 shows the existing operation of the A400 Hampstead Road junction with Drummond Street in the weekday AM and PM peak hour. Results have been extracted from a LINSIG model.

Table 5-20: 2012 baseline - A400 Hampstead Road/Drummond Street peak hour flow, DoS and queue lengths (PCU)

Junction approach – movement	AM peak hour (08:00 – 09:00)			PM peak hour (17:00 – 18:00)		
	Flow	DoS	MMQ	Flow	DoS	MMQ
Hampstead Road north – left/ahead	439	45%	7	267	28%	4
Hampstead Road north – ahead	457	45%	7	348	34%	5
Drummond Street east – left/ahead/right	142	56%	4	184	72%	5

Junction approach – movement	AM peak hour (08:00 – 09:00)			PM peak hour (17:00 – 18:00)		
	Flow	DoS	MMQ	Flow	DoS	MMQ
Hampstead Road south – left/ahead	183	19%	2	193	20%	2
Hampstead Road south – ahead	366	35%	5	640	62%	11
Drummond Street west – left/ahead	101	40%	2	95	38%	2

- 5.3.151 Table 5-20 shows that the longest queues occur on the A400 Hampstead Road north approach to the junction, during the AM peak hour. During the PM peak hour, the longest queues occur on the A400 Hampstead Road north approach to the junction. The predicted maximum queue lengths can be accommodated on A400 Hampstead Road without affecting upstream junctions.

### Hampstead Road with Cardington Street

- 5.3.152 Table 5-21 shows the existing operation of the Hampstead Road junction with Cardington Street in the weekday AM and PM peak hour. Results have been extracted from a validated LINSIG model.

Table 5-21: 2012 baseline - A400 Hampstead Road/Cardington Street peak hour flows, DoS and queue lengths (PCU)

Junction approach – movement	AM peak hour (08:00 – 09:00)			PM peak hour (17:00 – 18:00)		
	Flow	DoS	MMQ	Flow	DoS	MMQ
Hampstead Road north – left/ahead	443	32%	3	335	29%	3
Hampstead Road north – ahead	916	62%	10	561	46%	6
Cardington Street – left/right	131	52%	3	200	40%	4
Hampstead Road south – ahead/right	496	34%	4	832	68%	12

- 5.3.153 Table 5-21 shows that the longest queues occur on the A400 Hampstead Road north approach to the junction during the AM peak hour. During the PM peak hour, the longest queues occur on the A400 Hampstead Road south approach to the junction. The predicted maximum queue lengths can be accommodated on A400 Hampstead Road without affecting upstream junctions.

## Accidents and safety

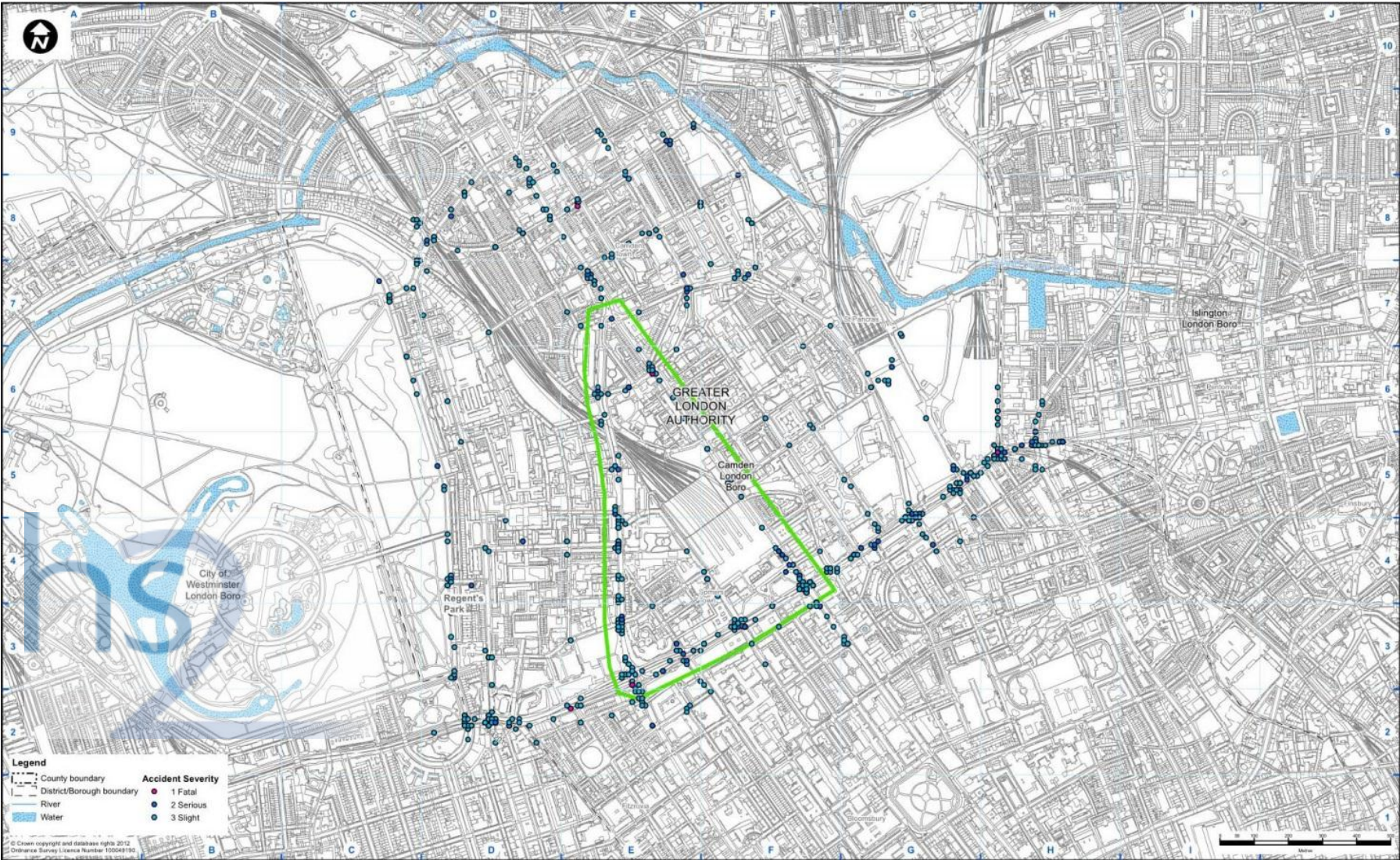
- 5.3.154 Accident data was obtained from TfL for the three year period up to the end of March 2012. A total of 264 personal injury accidents (PIA) occurred over the three year period in the study area, an average of 88 per year. The locations of the accidents are shown on Figure 5-7 below.
- 5.3.155 Of the 264 accidents, 88% were classified as slight, 11% involved a serious injury and 1% were fatal accidents. The highest number of accidents occurred along Euston Road and the junctions that intersect Euston Road (116 accidents), on Hampstead Road and the junctions that intersect Hampstead Road (74 accidents) and Eversholt Street (34 accidents).
- 5.3.156 Table shows a summary of the accidents within the local study area, at the locations where there were clusters
- 5.3.157 Table 5-22 shows a summary of the accidents within the local study area, at the locations where there were clusters of accidents (nine or more, in the three year period).

Table 5-22: Summary of accidents in the Euston station area

Location	Year			Total	Severity		
	Year 1	Year 2	Year 3		Fatal	Serious	Slight
A501 Euston Road/A4200 Eversholt Street/A4200 Upper Woburn Place	12	8	12	32	-	2	30
A501 Euston Road/Gordon Street/Melton Street	6	7	10	23	-	4	19
A400 Hampstead Road/Robert Street	5	10	6	21	-	2	19
A501 Euston Road/A400 Tottenham Court Road	9	8	13	30	1	1	28
A400 Hampstead Road/Drummond Street	4	6	5	15	-	2	13
A400 Camden High Street	6	2	5	13	-	2	11
A4200 Eversholt Street/Lidlington Place	3	4	2	9	1	-	8
A400 Hampstead Road/Cardington Street	1	6	2	9	-	-	9
A501 Euston Road/Churchway/Dukes Road	5	4	6	15	-	1	14



Figure 5-7: Location of accidents in the Euston station area





- 5.3.158 There were a further 390 accidents outside the local study, as shown outside the green line boundary in Figure 5-7. Table 5-23 below summarises accidents at locations outside the local study area, but within the CFA area, where there were clusters.

Table 5-23: Summary of accidents outside the Euston station area

Location	Year			Total	Severity		
	Year 1	Year 2	Year 3		Fatal	Serious	Slight
Pancras Road/Euston Road/Belgrove Road	11	11	7	29	-	4	25
A501 Euston Road/A5202 Midland Road/B504 Judd Street	5	9	10	24	-	3	21
Marylebone Road/Albany Street/Great Portland Street	5	7	8	20	-	3	17
Euston Road/ York Way/Grays Inn Road	7	6	10	23	1	2	20
Pentonville Road/ Caledonian Road	3	9	6	18	-	3	15
Marylebone Road/ Park Square East	4	4	5	13	-	1	12
Albany Street	3	4	5	12	-	2	10
Regents Park Outer Circle	2	6	7	15	-	4	11

### Waterways/canals

- 5.3.159 There are no navigable waterways or canals in the local area.

### Air transport

- 5.3.160 There are no air transport facilities available in the local area. Links to all London airports from Euston station can be made via LU and overground rail services. Birmingham Airport is also accessible from Euston station, using direct national rail (Virgin and London Midland) services.

## 5.4 Camden and HS1 Link (CFA2)

### Study Area

- 5.4.1 This section provides an overview of the baseline traffic and transport conditions for the section of the Proposed Scheme that passes through the Central Camden CFA.
- 5.4.2 It describes the transport infrastructure within the CFA, which would be affected either by the construction or operation of the Proposed Scheme. For this area, the baseline conditions relate to the transport network affected by construction of the proposed railway bridges and viaducts through the study area along with the operational impacts of the Proposed Scheme.
- 5.4.3 The scope of work and study area has been discussed with the key transport authorities including TfL and LBC.
- 5.4.4 The study area extends from the A5200 York Way in the east to the Regent's Park Road Bridge in the west, with the Proposed Scheme intersecting the TLRN at A503 Camden Road and the SRN at the A400 Kentish Town Road. The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFA2 Report), the core study area within the CFA boundary and the main road network can also be seen in Figure 5-8.
- 5.4.5 For ease of reference, the baseline transport conditions for each mode are generally described from east to west along the proposed route.

### Local land uses

- 5.4.6 The proposed route through the study area passes through a range of inner city urban land uses including residential, office, retail and generic business trades.

#### *St. Pancras Way to Camden Road*

- 5.4.7 The area around St. Pancras Way and Camden Road, is predominantly residential (C3) land use, with a mix of office (B1), retail (A1) and restaurants (A3)

#### *Camden Street to Kentish Town Road*

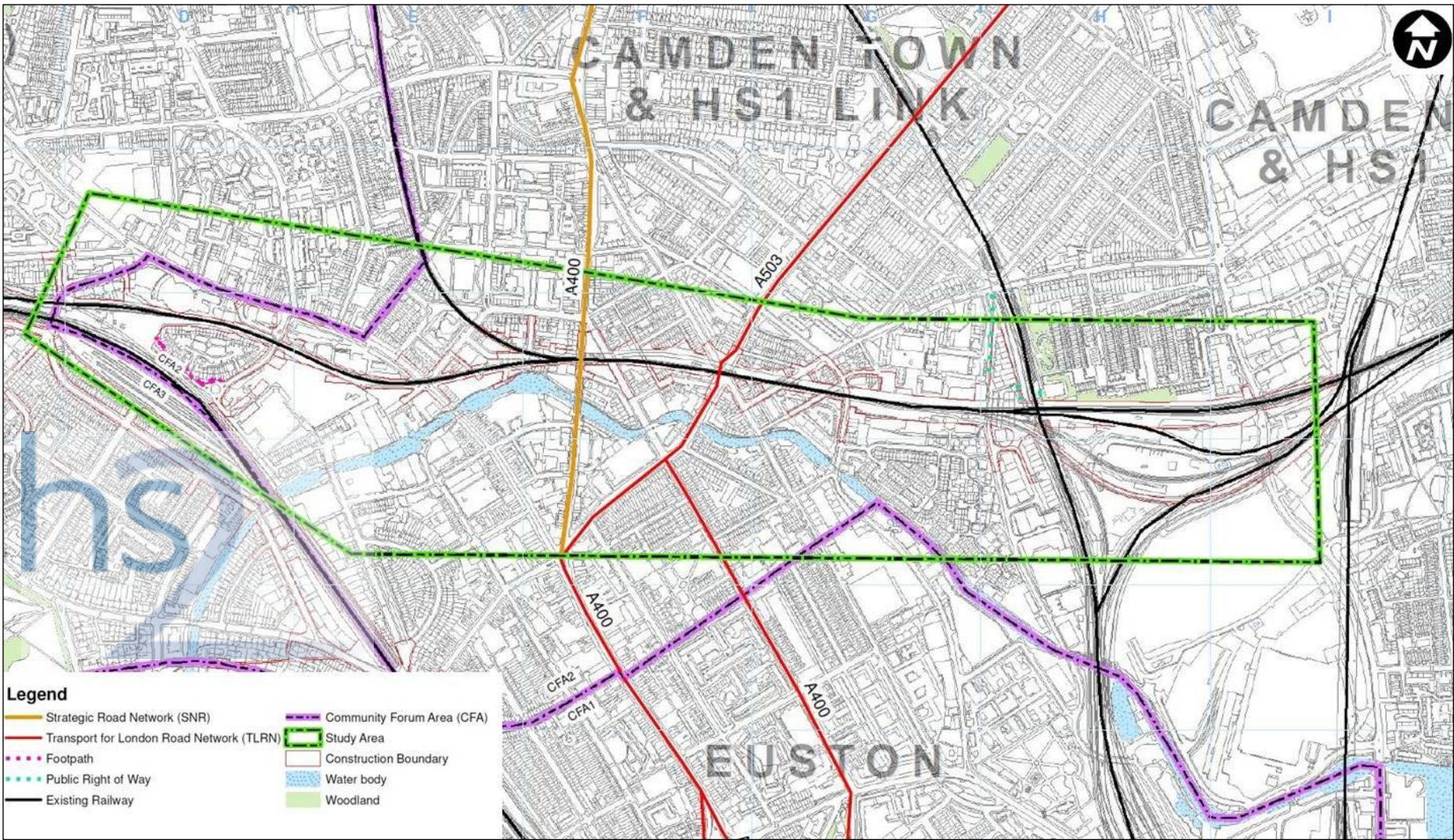
- 5.4.8 The area around Camden Street to Kentish Town Road is predominately a mix of office (B1) and residential (C3) land uses, along with non-residential (D1 dentist).

#### *Chalk Farm Road rail bridge to Primrose Hill Portal*

- 5.4.9 The area around Chalk Farm Road to Primrose Hill is a mixture of retail (A1 & A3), with residential (C3) and office (B1).



Figure 5-8: Camden & HS1 Link study area



## Surveys

- 5.4.10 Traffic, non-motorised user and station surveys were undertaken in the three-weeks between 18 June – 6 July 2012 during a period which avoided the effect of the Hammersmith Flyover emergency closure, National holidays (including the Queen’s Jubilee and Royal Wedding) and also the Olympics & Paralympics period. Non-motorised user and station surveys were undertaken in September 2012. The survey locations are shown within the Baseline Survey Report in Annex B(ii).

### *Traffic surveys*

- 5.4.11 The traffic surveys comprised:
- MCC at highway junctions - surveys were undertaken on a weekday between 07:00-10:00, 11:00-14:00 and 16:00-19:00 and on a Saturday between 10:00-14:00;
  - traffic signal staging - green time, intergreen and cycle time data was obtained from TfL, with saturation flow surveys at signal controlled junctions undertaken for the same time periods as the MCCs;
  - ATC on highway links across the study area - ATC data was gathered for a continuous two week period to coincide with the date of the MCCs; and
  - parking accumulation within the vicinity of the proposed construction works was recorded from 05:00-22:30 at 30-minute intervals on a weekday and at the weekend.

### *Non-motorised user surveys*

- 5.4.12 Pedestrian flow surveys at junctions were undertaken in parallel with the MCC surveys.
- 5.4.13 There are no PRow recorded in the Camden area; however, as well as the pedestrian flows at junctions, non-motorised user surveys were undertaken in August and September 2012 for all roads and associated footways intersected by the proposed line of route.
- 5.4.14 The August and September surveys were carried out between 08:00 and 18:00 on a weekend to capture leisure users. The September surveys were undertaken on a weekday between 07:00 and 10:00; 11:00 and 14:00; and 16:00 and 19:00 to capture school and commuting users.
- 5.4.15 Surveys were undertaken in August and September on a Saturday and/or Sunday between 08:00 and 18:00, to reflect the peak movement demands along these routes. In addition, surveys were conducted on a weekday during September with a view to capturing ‘commuter’ movements on those routes which serve areas which may be used for purposes other than leisure and recreation.



### *Station surveys*

- 5.4.16 Pedestrian surveys were carried out at Camden Road Overground station during a weekday AM peak period (08:00-09:00). The survey data is contained with the Baseline Survey Report in Annex B(ii).

### **Highway network**

- 5.4.17 The following section describes the roads within the study area. Survey and model data indicates that the highway network in Camden is heavily congested in peak periods. The following TLRN roads; A400 Camden High Road, A503 Camden Road and A400 Camden Street are particularly prone to congestion. Due to the dense urban grain and high traffic flows within Camden Town and HS1 Link area, many of the strategic routes are subject to one way working. Height restrictions to the existing rail overbridges in the area vary.

### *Strategic road network*

#### **Motorway network**

- 5.4.18 The M40/M25 junction is located approximately 25km to the west of the study area, while the southernmost end of the M1 at Hendon is located 6km to the north and easternmost end of the M4 at Chiswick is located some 11km to the south west.

#### **'A' roads**

- 5.4.19 The nearest TLRN road to the HS1 Link is the A503 Camden Road. It is noted that Camden Road construction works lie on the A503. This connects with the A400 Kentish Town Road and A4200 Eversholt Street TLRN one-way working gyratory system to the south and the A1 TLRN to the north. A more detailed breakdown of the TLRN in relation to the main areas in the CFA is set out below:
- Camden Road rail overbridge structure spans across the A503 Camden Road TLRN;
  - Camden Street rail bridge to Kentish Town Road rail bridge lies approximately 200m to the west of the A503 Camden Road; and
  - Chalk Farm Road rail bridge lies approximately 500m to the west of the A503 Camden Road.

### *Local road network*

#### **St. Pancras Way to Camden Road**

- 5.4.20 The St. Pancras Way/Baynes Street Rail Bridge spans both St. Pancras Way and Baynes Street. St. Pancras Way is single-carriageway running one-way in the north-south direction between its junction with Royal College Street and A501 Euston Road. Baynes Street lies within a 32kph (20mph) zone. It is a single-carriageway one-way road running from northeast to southwest from its junction with St. Pancras Way to Royal College Street.
- 5.4.21 Randolph Street is a single-carriageway one way road running southwest to northeast from Royal College Street to St. Pancras Way. The rail bridge has a height limit of 14'6" above Randolph Street. Public transport vehicles and vehicles over five tonnes are prohibited between 18:30 – 24:00 and 24:00 – 08:00. Rousden Street which is a two-way road connects Camden Road with the western section of Randolph Street.
- 5.4.22 The Camden Road rail bridge spans the A503 Camden Road and Royal College Street. Camden Road is two-way road with two lanes in each direction and Royal College Street operates as a one-way street with three lanes running in the northbound direction. Camden Road is a part of the TLRN and Royal College Street is a TLRN side road for a short distance either side of Camden Road and for the majority of its length is a Borough road.
- 5.4.23 The Camden Road station viaduct spans Prowse Place which is a narrow cobbled street connecting Jeffrey's Street with Bonny Street.

#### **Camden Street to Kentish Town Road**

- 5.4.24 Camden Street is a one-way road with three lanes running southbound from its junction with Kentish Town Road at its northern end and Crowndale Road at its southern end. Camden Street is a borough road from the Kentish Town Road junction to a point approximately 60m north of its junction with Camden Road. Beyond this point Camden Street is a red route and part of the TLRN.
- 5.4.25 Kentish Town Road is two-way single lane carriageway with the exception of a short section which operates one-way northbound from its junction with Camden Road to the junction with Hawley Crescent.

#### **Chalk Farm Road to Primrose Hill**

- 5.4.26 Chalk Farm Road is a single lane, two-way road that runs southeast-northwest between Chalk Farm station and Camden Lock market. Southeast-bound traffic on Chalk Farm Road is compelled to turn left into Castlehaven Road heading northeast-bound as southeast of the bridge, Camden High Street is one-way northwest-bound. Castlehaven Road which connects with Hawley Road operates as one-way road eastbound connecting with Kentish Town Road and Camden Street to the east.

- 5.4.27 Haven Street (Kentish Town viaduct) is a no-through road, lying around 60m to the northeast and parallel with the A502 Chalk Farm Road.
- 5.4.28 Juniper Crescent is a single lane two-way road which provides access to a residential apartment blocks and to Morrison's supermarket. Juniper Crescent is a no-through road; access and egress from Juniper Crescent can only be made via the access road to/from Chalk Farm Road. The section leading to the residential apartment blocks is traffic calmed with a 10mph speed limit and speed humps.
- 5.4.29 Regent's Park Road (Primrose Hill tunnel portal) is a westbound one-way working single carriageway road with an advisory contraflow cycle lane in the eastbound direction towards Chalk Farm Road.

### *Baseline conditions*

- 5.4.30 This section examines baseline traffic flows on the strategic and local highway network.

Table 5-24: Camden and HS1 Link 2012 baseline flows

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
A5203 Caledonian Road (south of Wheelwright Road)	Northbound	321	10	459	5
	Southbound	728	43	484	4
A5200 York Way (north of Vale Road)	Northbound	280	38	405	20
	Southbound	573	38	366	10
A5202 St Pancras Way (north of Baynes Street)	Southbound	716	34	555	6
Randolph Street (East of Royal College Street)	Eastbound	92	2	242	1
Royal College Street (south of Camden Rd)	Northbound	351	25	485	10
A503 Camden Road (south of Royal College St)	Northbound	563	32	876	14
	Southbound	880	56	636	20
A400 Camden Street (south of Camden Gardens)	Southbound	1203	65	763	16
A400 Kentish Town Road (south of Camden Gardens)	Northbound	297	18	474	17
	Southbound	268	27	241	1
Hawley Road	Northbound	1014	56	1074	20
A502 Chalk Farm Road (west of Hawley Street)	Northbound	87	10	221	11
	Southbound	840	43	746	16

- 5.4.31 The operation of the main junctions which form the main access routes from the strategic network to the study area sites have been analysed for the 2012 existing conditions and the results are summarised below.

### York Way/Market Road Junction

- 5.4.32 This junction is a small three-arm roundabout with single lane approaches and exits. There are zebra crossings on the northern (York Way) and eastern (Market Road) arms. There are no bus lanes at the junction, however Market Road has a cycle lane on the approach and exit and the York Way southern arm has a cycle lane on the exit. All arms have parking on both sides except for the York Way southern arm exit. Two bus routes, the 390 and 274, run through the junction, with route 390 serving York Way and route 274 entering the junction from York Way north arm and egressing via Market Road.
- 5.4.33 Table 5-25 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated CLOHAM model.

Table 5-25: 2012 baseline performance at York Way/Market Road junction (roundabout)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
York Way (SB)	294	60	0
Market Road	98	16	0
York Way (NB)	378	41	0
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
York Way (SB)	134	33	0
Market Road	168	21	0
York Way (NB)	620	68	0

- 5.4.34 The model shows that this junction operates well below its capacity in AM and PM peak hours. No queuing is observed at the junction. York Way carried the highest flows and is the arm with the highest DoS, at 68%.

### Pentonville Road/Penton Street/Claremont Square

- 5.4.35 This junction is a four-arm signalised junction with controlled pedestrian crossing facilities on each arm. Pentonville Road (the east and west arms of the junction) has two relatively narrow lanes in each direction (reducing to one on the western arm exit), while the other arms are single lane approaches and exits. Advanced cycle stoplines (ASLs) are present on all arms, with a minimal 'gate' for entry to them on the Pentonville Road arms but with full cycle lanes on the other two arms. Penton Street and Claremont Square also have cycle lanes on the exits.



- 5.4.36 Parking places are present on the Penton Street and Claremont Street approaches but set some way back from the junction. Bus routes 30, 73, 205, 214 and 476 all run through the junction along Pentonville Road in both directions.
- 5.4.37 Table 5-26 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated CLoHAM model.

Table 5-26: 2012 baseline performance at junction Pentonville Road/Penton Street/Claremont Square (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Penton Street	345	91	8
Pentonville Road (WB)	760	61	11
Claremont Square	242	48	4
Pentonville Road (EB)	1085	63	15
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Penton Street	74	98	5
Pentonville Road (WB)	845	63	11
Claremont Square	232	94	5
Pentonville Road (EB)	1012	52	13

- 5.4.38 The junction currently performs close to its capacity in AM and PM Peak hours. Pentonville Road, which is the major road of this junction, operates under its capacity in both west- and eastbound directions. Penton Street and Claremont Square are the smaller roads with corresponding lower traffic flows. Penton Street moderately runs over-capacity in both peak hours. Claremont Square experiences over-capacity at PM peak hour only.

### **A502 Chalk Farm Road/Camden High Street/Castlehaven Road Junction**

- 5.4.39 This junction is a three-arm signalised intersection with a large pedestrian refuge island and controlled pedestrian crossings at each stop line. Castlehaven Road is one way eastbound away from the junction. Camden High Street one-way northbound towards the junction. Camden High Street is a single lane road, which widens into two lanes closer to the junction to simultaneously allow straight ahead (to Chalk Farm Road) and right-turning (to Castlehaven Road) movements. The Chalk Farm Road entry arm has a cycle lane with an ASL. Camden Lock Place is a pedestrianised arm to the west, but which has removable bollards to allow access and egress for vehicles loading and unloading. Vehicles exiting Camden Lock Place would make an uncontrolled left turn into Chalk Farm Road downstream of the signal stop line and pedestrian crossing in Camden High Street.

- 5.4.40 The junction caters for high volumes of pedestrians due to the presence of Camden Lock Market. Bus routes 31, 168, 24 and 27 run through the junction. All the bus routes travel northbound along Camden High Street and Chalk Farm Road, except for the route 168 which enters the junction southbound on Chalk Farm Road and exits northeast-bound on Castlehaven Road.
- 5.4.41 The London Overground train line passes above the junction on a bridge. The junction is also adjacent to Regent's Canal to the south at about 40m distance.
- 5.4.42 Table 5-27 below shows the existing operation of this junction in the weekday AM and PM peak hour. Results have been extracted from the validated CLOHAM model.

Table 5-27: 2012 baseline performance at junction Chalk Farm Road / Camden High Street/Castlehaven Road (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
A502 Camden High Street	341	99	7
A502 Chalk Farm Road (SB)	920	83	6
A502 Castlehaven Road	N/A	N/A	N/A
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
A502 Camden High Street	621	99	11
A502 Chalk Farm Road (SB)	795	83	7
A502 Castlehaven Road	N/A	N/A	N/A

- 5.4.43 The model shows that the junction operates slightly over its capacity in both AM and PM peak hours. The Chalk Farm Road arm functions just below its capacity, while the Camden High Street arm experiences over-capacity at 99% degrees of saturation (DoS). Some congestion is observed on Camden High Street during PM peak hours.

### **Kentish Town Road/Hawley Crescent Junction**

- 5.4.44 The junction is a three-arm signalised intersection with controlled pedestrian crossing facilities on the Kentish Town Road southern arm only. The southern arm of Kentish Town Road is one-way northbound towards the junction, with two lanes plus a cycle lane and ASL. Hawley Crescent is one-way westbound away from the junction.
- 5.4.45 The Kentish Town Road southern approach and Hawley Crescent have some limited car parking on one side of the road. The eastern arm is a signalised two-lane access to Sainsbury's supermarket car parking area. The junction is just south of Regent's Canal, which is crossed by the northern arm of Kentish Town Road. No bus services use this Junction.

- 5.4.46 Table 5-28 below shows the existing Table 5-28 operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated CLoHAM model.

Table 5-28: 2012 baseline performance at junction Kentish Town Road / Hawley Crescent (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Kentish Town Road (SB)	296	44	3
Kentish Town Road (NB)	346	59	4
Hawley Crescent	N/A	N/A	N/A
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Kentish Town Road (SB)	243	37	3
Kentish Town Road (NB)	526	90	7
Hawley Crescent	N/A	N/A	N/A

- 5.4.47 The model shows that the junction operates at or within capacity in the AM and PM peak hours, with the northbound approach reaching practical capacity (90% DoS) in the PM peak only.

### **Parkway/Arlington Road Junction**

- 5.4.48 This junction is a four-arm signalised intersection with controlled pedestrian crossing facilities on Arlington and Parkway west approaches. Parkway is a one-way double-lane road in east to west direction. All junction entry arms are featured with Advanced Cycle Stoplines (ASLs). While car parking is provided on both arms of Arlington Road, the sought arm includes parking places on either sides of the road. The nearby Camden Town Tube Station may imply a potential for high pedestrian movement at the junction. No bus routes run through the junction.
- 5.4.49 Table 5-29 below shows the existing operation of Parkway/Arlington Road junction in the weekday AM and PM peak hour. Results have been extracted from the validated CLoHAM model.

Table 5-29: 2012 baseline performance at junction Parkway / Arlington Road (signals)

	2012 AM Baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Arlington Road (SB)	92	28	1
Parkway (SB)	N/A	N/A	N/A
Arlington Road (NB)	5	1	0
Parkway (NB)	716	34	6
	2012 PM Baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Arlington Road (SB)	146	44	2
Parkway (SB)	N/A	N/A	N/A
Arlington Road (NB)	24	6	0
Parkway (NB)	801	38	7

- 5.4.50 The model shows that the junction performs well within capacity during both AM and PM peak hours. Parkway, being a major road of this junction, has elevated peak hour flows which contribute to a slight queue accumulation.

### Haverstock Hill/England's Lane Junction

- 5.4.51 This junction is a three-way signalised junction with controlled pedestrian crossing facilities on each arm. All the entry lanes have cycle lanes with ASLs. Parking places exist on exit lanes of England's Lane and the northern arm of Haverstock Hill. There are two accesses to the parking area of the buildings along Haverstock Hill that are close to the junction.
- 5.4.52 Bus route 168 and C11 run through the junction. Route 168 travels in both directions along Haverstock Hill, while the C11 route turns right from Haverstock Hill into England's Lane and from England's Lane left into Haverstock Hill. There are bus stops located on England's Lane close to the junction.
- 5.4.53 Table 5-30 below shows the existing operation of Haverstock Hill / England's Lane Junction in the weekday AM and PM peak hour. Results have been extracted from the validated CLOHAM model.

Table 5-30: 2012 baseline performance at junction Haverstock Hill/England's Lane (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Haverstock Hill (SB)	650	102	8
Haverstock Hill (NB)	221	31	2
England's Lane	116	35	2
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Haverstock Hill (SB)	577	86	7
Haverstock Hill (NB)	208	29	3
England's Lane	144	44	2

- 5.4.54 The model shows that the junction operates just over its capacity in the AM peak, with Haverstock Hill (SB) operating with a DoS of 102%. The model shows that the junction performs within capacity in the PM peak.

### St. Pancras Way/Camden Road

- 5.4.55 This junction is a four-arm signalised intersection with controlled pedestrian crossing facilities on northern arm of St. Pancras Way only. St. Pancras Way is a two lane one-way road carrying north to south traffic. The road is also fully supplemented by cycle lanes on both arms with ASLs on the approach arm. Camden Road is a large two-way road and with two lanes in each direction.
- 5.4.56 There are bus stops on Camden Road just downstream from the junction. Bus routes 29, 253 run through the junction along Camden Road. Parking spaces are available on the eastern arm of Camden Road on both sides at some distance from the junction.
- 5.4.57 Table 5-31 below shows the existing operation of St. Pancras Way/Camden Road junction in the weekday AM and PM peak hour. Results have been extracted from the validated CLOHAM model.

Table 5-31: 2012 baseline performance at junction St. Pancras Way / Camden Road (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
St. Pancras Way (SB)	361	38	5
Camden Road (WB)	1157	56	10
Camden Road (EB)	709	36	6
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
St. Pancras Way (SB)	573	55	8
Camden Road (WB)	732	37	7
Camden Road (EB)	812	41	8

- 5.4.58 The model shows that the junction operates well within its capacity in AM and PM peak hours. Camden Road is a strategic road, part of the TLRN, with higher flow capacity and carries a higher overall traffic volume.

### Royal College Street/Camden Road

- 5.4.59 This junction is a four-arm signalised intersection with controlled pedestrian crossing facilities on southern arms of Camden Road and Royal College Street. Royal College Street is one-way northbound and has three lanes on the approach arm, which reduces to two lanes on the exit arm. The junction has ASLs on all the approaches with short entry 'gates'. Camden Road has two-way traffic and has two relatively narrow lanes in each direction. There are two bridges above the junction carrying London Overground services, one of which is non-operational.
- 5.4.60 Camden Road Overground station is just next to the junction, which potentially may generate a high-volume of pedestrian movements at the junction in the AM and PM peak hours. There are car parking and loading bays on both sides of the northern arm of Royal College Street. Parking places are also available on Camden Road at some distance from the junction. While 274, 29, 253 bus services run through the junction on Camden road, the bus route 274 enters the junction from Royal College Street and turns left into the southern arm of Camden Road.
- 5.4.61 Table 5-32 below shows the existing operation of Royal College Street/Camden Road junction in the weekday AM and PM peak hour. Results have been extracted from the validated CLOHAM model.

Table 5-32: 2012 baseline performance at junction Royal College Street/Camden Road (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Royal College Street (SB)	N/A	N/A	N/A
Camden Road (SB)	954	64	12
Royal College Street (NB)	390	37	5
Camden Road (NB)	639	40	7
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Royal College Street (SB)	N/A	N/A	N/A
Camden Road (SB)	676	51	8
Royal College Street (NB)	510	48	6
Camden Road (NB)	935	61	11

- 5.4.62 The model shows that this junction performs well within its capacity in AM and PM peak hours. Camden Road is a strategic road, part of the TLRN, with higher flow capacity and carries higher overall traffic volume.

## Castlehaven Road/Hawley Road

- 5.4.63 This junction is a three-arm non-signalised intersection. Castlehaven Road south arm and Hawley Road are wide, two lane, one-way northeast-bound roads. Castlehaven Road north arm is a two-way road with southbound traffic giving way to the Castlehaven Road (south)/Hawley Road traffic. Castlehaven Road (north) is traffic calmed with a junction entry treatment, speed table, pedestrian refuge island and narrow lanes at this junction.
- 5.4.64 The junction entry treatment on the northern arm of Castlehaven Road features a segregated cycle lane for northbound cyclists turning left from Castlehaven Road south into Castlehaven Road north. There is also a two-way cycle lane through the pedestrianised area to the west of the junction. Parking bays exist on all the approach and exit lanes in close proximity to the junction.
- 5.4.65 Bus routes 24, 27 and 168 run through the junction from Castlehaven Road south to Hawley Road with the bus stop on Hawley Road. There is a London Overground bridge above the southern arm of Castlehaven Road close to the junction.
- 5.4.66 Table 5-33 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated CLOHAM model.

Table 5-33: 2012 baseline performance at junction Castlehaven Road/Hawley Road (no signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Castlehaven Road (SB)	219	47	0
A502 Hawley Road	N/A	N/A	N/A
A502 Castlehaven Road (NB)	1115	22	0
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Castlehaven Road (SB)	251	50	0
A502 Hawley Road	N/A	N/A	N/A
A502 Castlehaven Road (NB)	1135	23	0

- 5.4.67 The model shows that this junction operates safely within its capacity in AM and PM peak hours. No queuing is observed at the junction. The southern arm of Castlehaven Road performs better having a smaller DoS value although carrying a greater traffic volume.



## Hawley Road/Kentish Town Road/Camden Street

- 5.4.68 This junction is a four-arm signalised intersection with controlled pedestrian crossing facilities on each arm. Jeffrey's Street also adjoins the junction from the east, but it is closed by a gate which is opened for emergency fire access only. Hawley Road, with one-way approach traffic, widens towards the junction from two to three lanes plus a segregated cycle lane and ASL. Traffic from Hawley Road can only travel straight ahead into Camden Street and right onto Kentish Town Road. Camden Street is two lanes wide and one-way southbound away from the junction. Kentish Town Road is two-way with a single-lane in each direction. Northbound traffic on the southern arm of Kentish Town Road is only permitted to travel straight ahead to the northern arm of Kentish Town Road. All approaches to the junction have ASLs.
- 5.4.69 Bus routes 24, 27, 46, 134, 168, 214, C2, N5 and N20 traverse the junction. Routes 24, 27, 168 and N5 travel southeast bound along Hawley Road and Camden Street. Routes 46, 134, 214, C2 and N20 travel southbound from Kentish Town Road to Camden Street. Routes 134, C2 and N20 travel northbound on Kentish Town Road.
- 5.4.70 Table 5-34 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated CLOHAM model.

Table 5-34: 2012 baseline performance at junction Hawley Road/Kentish Town Road/Camden Street (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Kentish Town Road (SB)	561	87	7
Camden Street	N/A	N/A	N/A
Kentish Town Road (NB)	346	45	4
A502 Hawley Road	1208	77	13
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Kentish Town Road (SB)	423	66	5
Camden Street	N/A	N/A	N/A
Kentish Town Road (NB)	526	74	6
A502 Hawley Road	1160	75	13

- 5.4.71 Although the model shows that this junction operates within capacity in AM and PM peak hours, Kentish Town Road (SB) is running almost at practical capacity. There is noticeable queuing on Hawley Road during the both peak hours.

### Camden High Street/Hawley Crescent/Jamestown Road

5.4.72 This is a small four-arm signalised intersection with controlled pedestrian crossing facilities on each arm. Camden High Street (the north and south arms of the junction) has one relatively wide lane and is a one-way road with traffic travelling northbound. Hawley Crescent is a one-way approach road with two lanes. Jamestown Road is a single lane two-way link. No cycle lanes are provided on the arms of the junction. Bus routes 24, 27, 31 and 168 travel through the junction all along Camden High Street. There is a potential for high volume of pedestrian movement around the junction due to the presence of numerous shops along Camden High Street.

5.4.73 Table 5-35 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated CLOHAM model.

Table 5-35: 2012 baseline performance at junction Camden High Street/Hawley Crescent/Jamestown Road (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Camden High Street (SB)	N/A	N/A	N/A
Hawley Crescent	296	33	5
Camden High Street (NB)	109	7	2
Jamestown Road	232	52	3
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Camden High Street (SB)	N/A	N/A	N/A
Hawley Crescent	243	25	5
Camden High Street (NB)	160	13	2
Jamestown Road	461	98	6

5.4.74 The model shows that this junction performs over capacity in PM peak hour with greater traffic flow on Jamestown Road. This results in a longer queue on this approach. Overall the AM peak hour junction performance is well within capacity.

### Kentish Town Road/Camden Road/Greenland Road/Camden High Street/Parkway

- 5.4.75 This is a complex six-arm signalised intersection with controlled pedestrian crossing facilities on each arm. All the junction arms are one-way. The traffic is contributed to the junction by the southern arm of Camden High Street and Parkway only. All the other arms carry traffic away from the junction. The southern arm of Camden High Street widens closer to the junction from three lanes including the bus lane to four lanes. The traffic is split by a large pedestrian refuge island with two lanes dedicated for the traffic travelling further along the Camden High Street and two lanes devoted to allow traffic towards Kentish Town Road and Camden Road.
- 5.4.76 There is a bus lane on the approach arm of Camden High Street which terminates before the junction. Bus routes 168, 31, 24 and 27 all run northbound along Camden High Street. There is a bus stop on southern arm of Camden High Street close to the junction. Limited parking bays are available on Camden High Street approach road, Camden Road and Kentish Town Road. High volume pedestrian movement is expected due to the presence of Camden Town Tube Station.
- 5.4.77 Table 5-36 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated CLoHAM model.

Table 5-36: 2012 baseline performance at junction Kentish Town Road/Camden Road/Greenland Road/Camden High Street/Parkway (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Camden High Street (NB)	566	16	5
Parkway	722	23	10
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Camden High Street (NB)	1010	28	10
Parkway	827	26	12

- 5.4.78 The model shows that this junction performs well within its capacity in AM and PM peak hours. PM peak hour sees greater number of vehicles which is safely accommodated by the junction. There is some congestion building up in peak times on Parkway.

### Camden Road/Camden Street

- 5.4.79 This junction is a four-arm signalised intersection with controlled pedestrian crossing facilities on Camden Street (the northern and southern arms of the junction). Camden Street is a one-way road with traffic flowing from north to south. It has four entry and two exit lanes from the junction. A cycle lane is provided on Camden Street exit arm. Camden Road is a double-lane two-way link. There are bus stops either side of the western arm of Camden Road immediately next to the junction.
- 5.4.80 Regent's Canal lies immediately to the north of the junction. The junction is heavily utilised by bus services. Bus routes 24, 29, 46, 88, 134, 168, 214, 253, 274 and C2 intersect the junction in all directions. The south arm of Camden Street is used by route 46 only. The other arms share the remaining bus routes with the western arm of Camden Road carrying the greatest share of bus routes. The British Transport Police building is situated on the north side of the junction. There is a car parking area behind the building with access from northern arm of Camden Street.
- 5.4.81 Table 5-37 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated CLOHAM model.

Table 5-37: 2012 baseline performance at junction Camden Road/Camden Street (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Camden Street (SB)	1353	67	19
Camden Road (SB)	972	85	13
Camden Road (EB)	646	33	6
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Camden Street (SB)	860	64	14
Camden Road (SB)	691	46	8
Camden Road (EB)	945	41	7

- 5.4.82 The model shows that this junction operates at capacity in AM peak hour and within capacity in PM peak hour. A high level of queuing is observed on north arms of Camden Street and Camden Road with maximum queuing length of up to 19 vehicles. However, this is accommodated by the junction and within the saturation limits.

### St. Pancras Way/Agar Grove/Randolph Street

- 5.4.83 This junction is a four-arm signalised intersection with controlled pedestrian crossing facilities on all the arms except the southern arm of St. Pancras Way. St. Pancras Way is a one-way road southbound. The northern arm of St. Pancras Way has a mandatory cycle lane on the east side for straight ahead and left turning cyclists and an advisory cycle lane, for straight ahead movements, on the west side. The southern arm of St. Pancras Way has a single exit lane, widening to two lanes further to the south. It has a segregated northbound contraflow cycle lane on its west side. Cyclists entering the junction from the south use a push button to enter a demand into the signal cycle and have a compulsory right turn into Agar Grove. ASLs are provided in St. Pancras Way northern arm and in Agar Grove with a mandatory cycle lane on this approach. Agar Grove has single lane in each direction.
- 5.4.84 Randolph Street is one-way eastbound. It has two lanes on the approach that reduce to one at the junction. Parking spaces are available on both sides of Randolph Street. Bus route 274 enters the junction using Agar Grove and exits through St. Pancras Way southbound.
- 5.4.85 Table 5-38 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated CLoHAM model.

Table 5-38: 2012 baseline performance at junction St. Pancras Way / Agar Grove / Randolph Street (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
St. Pancras Way (SB)	565	45	9
Agar Grove	64	9	1
St. Pancras Way (NB)	N/A	N/A	N/A
Randolph Street	68	12	1
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
St. Pancras Way (SB)	476	38	8
Agar Grove	14	2	0
St. Pancras Way (NB)	N/A	N/A	N/A
Randolph Street	163	31	3

- 5.4.86 The model shows that this junction operates safely within its capacity in both AM and PM peak hours. Low traffic movement and negligible queuing is observed on Agar Grove and Randolph Street. St. Pancras Way is the main road at this junction with corresponding higher flow and longer the queue length.

### Kentish Town Road/Farrier Street

5.4.87 This is a small three-arm non-signalised intersection. No pedestrian crossing facilities are provided at the junction. Kentish Town Road is the priority road at this junction and Farrier Street adjoins it from the east. All the arms are single-lane two-way roads. There is bus lane on the northern Kentish Town Road arm. The bus routes 46, 134, 214 and C2 intersect the junction along Kentish Town Road.

5.4.88 Table 5-39 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated CLOHAM model.

Table 5-39: 2012 baseline performance at junction Kentish Town Road / Farrier Street (no signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Kentish Town Road (SB)	799	40	0
Farrier Street	140	22	0
Kentish Town Road (NB)	482	28	0
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Kentish Town Road (SB)	514	26	0
Farrier Street	243	42	0
Kentish Town Road (NB)	1022	63	0

5.4.89 The model shows that this junction performs within capacity in AM and PM peak hour. No queue is observed at the junction. Kentish Town Road is the primary road at this junction and carries the higher traffic flow.

### Castlehaven Road/Prince of Wales Road/Grafton Road

5.4.90 This is a four-arm signalised staggered intersection with controlled pedestrian crossing facilities on Castlehaven Road, Grafton Road and the western arm of Prince of Wales Road. Left turn only is permitted for approaching vehicles on Castlehaven Road and Grafton Road. Cycle lanes with ASLs feature approaches on all arms of the junction. There are parking spaces close to the junction on all arms. Bus routes 46 and 393 travels through the junction along Prince of Wales Road.

5.4.91 Table 5-40 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated CLOHAM model.

Table 5-40: 2012 baseline performance at junction Castlehaven Road / Prince of Wales Road (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Grafton Road	244	95	3
Prince of Wales Road (WB)	335	66	3
Castlehaven Road	346	32	4
Prince of Wales Road (EB)	94	21	2
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Grafton Road	232	90	3
Prince of Wales Road (WB)	355	72	6
Castlehaven Road	603	55	7
Prince of Wales Road (EB)	136	29	3

- 5.4.92 The model shows that this junction performs within its capacity in AM and PM peak hours. PM peak hour sees greater amount of traffic and higher queuing lengths. Low traffic volumes travel through the western arm of Prince of Wales Road.

### Chalk Farm Road / Harmood Street

- 5.4.93 This is a minor three-arm non-signalised intersection with pedestrian 'zebra' crossing on eastern arm of Chalk Farm Road. Chalk Farm Road is the primary road and Harmood Street adjoins it from the north. All the arms are single-lane two-way roads. Bus stops exist on both arms of Chalk Farm Road close to the junction. There are no cycle provisions at this junction, other than cycle parking stands on the footway. Limited parking spaces are provided on the west arm of Chalk Farm Road. Bus routes 24, 27, 31, 168 and 748 use the junction as part of their services travelling along Chalk Farm Road.
- 5.4.94 Table 5-41 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated CLOHAM model.



Table 5-41: 2012 baseline performance at junction Chalk Farm Road / Harmood Street (no signals)

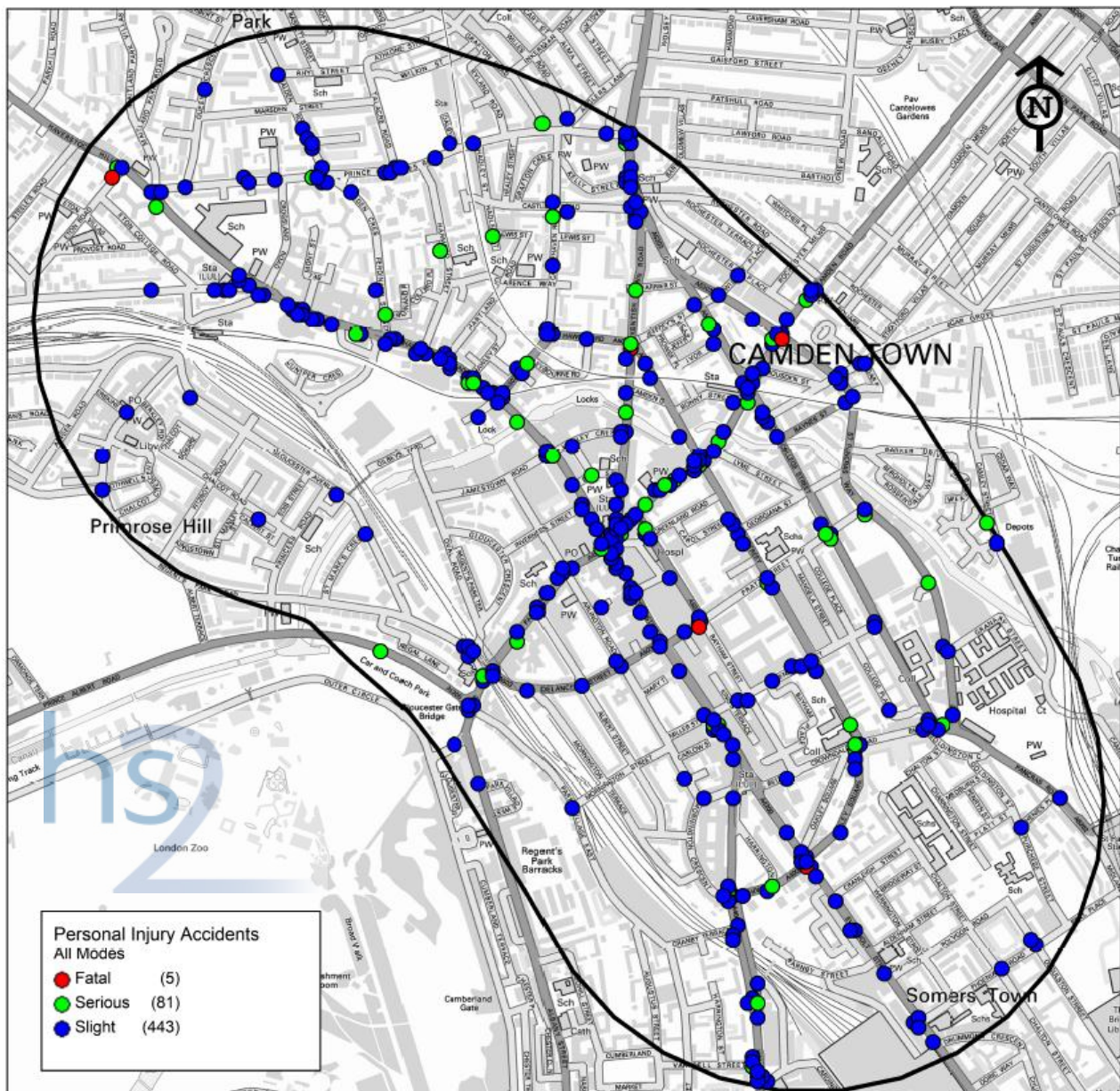
	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Harmood Street	396	70	1
Chalk Farm Road (NB)	132	6	0
Chalk Farm Road (SB)	920	46	0
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Harmood Street	212	36	0
Chalk Farm Road (NB)	272	13	0
Chalk Farm Road (SB)	878	44	0

- 5.4.95 The model shows that this junction operates within its capacity in AM and PM peak hours. The northern arm of Chalk Farm Road carries the higher amount of traffic. No queuing is observed at the junction.

### Accidents and safety

- 5.4.96 Accident data covering a 36-month period to the end of March 2012 was obtained from TfL. A total of 529 PIA occurred over the three year period in the study area, an average of 176 per year. The locations of the accidents are shown in Figure 5-9.

Figure 5-9: Camden and HS1 Link - location, number of accidents and severity for all users



Source: TfL

- 5.4.97 Of the 529 accidents, 84% were classified as slight, 15% involved a serious injury and 1% were fatal accidents. A large number of accidents occurred along the main strategic routes of the A400 Camden High Street/Chalk Farm Road and the A503 Camden Road with a high cluster of collisions recorded at the junction of A400 Kentish Town Road/A503 Camden Road/A502 Camden High Street.
- 5.4.98 Table 5-42 shows that within the Camden Town and HS1 Link study area there is a higher level of fatal and serious accidents than elsewhere in Camden and the rest of Greater London.

Table 5-42: Accident records (Camden)

Area	Fatal	Serious	Slight	Total accidents
CFA2	5	81	443	529
Mean PIA per annum	1.6	27	147.6	176.3

## Parking and loading

- 5.4.99 This section describes the parking controls in the vicinity of the Proposed Scheme in the Camden and HS1 Link study area and presents the results of the parking accumulation surveys undertaken in June 2012.

### St. Pancras Way/Baynes Street

- 5.4.100 Baynes Street falls within Controlled Parking Zone (CPZ) CA-G (Monday – Friday 08:30 – 18:30). At the eastern end of Baynes Street there are parking bays for permit holders only for up to 12 cars. Six further pay and display car parking spaces are provided in the middle section of the road.
- 5.4.101 There are no designated parking spaces on St. Pancras Road in the vicinity of the rail bridge.

### Randolph Street

- 5.4.102 Randolph Street is within CPZ CA-G (Monday – Friday 08:30 – 18:30). Designated parking bays for resident permit holders and pay and display are provided along sections of both sides of the road.

### Camden Road/Royal College Street

- 5.4.103 The following red route parking restrictions apply to the designated parking bays on Camden Road and Royal College Street: No stopping between Monday – Saturday 07:00 – 19:00 except 10:00 – 16:00 loading for 20 minutes and no return within 40 minutes.

### Prowse Place

- 5.4.104 Prowse Place has resident permit parking bays on the northern side of the bridge located along its eastern side, sufficient for six cars. Parking is restricted to permit holders CA-F (Monday – Friday 08:30–18:30 and Saturday –Sunday 09:30–17:30).

### Camden Street / Kentish Town Road

- 5.4.105 There are approximately six pay and display parking bays on the western footway beneath the Camden Street rail bridge. The following restrictions apply: Monday – Friday 08:30–18:30 and Saturday - Sunday 09:30–17:30 (maximum stay two hours).

- 5.4.106 There are no designated parking bays in the vicinity of the Kentish Town Road rail bridge, however the following parking and loading restriction applies: Monday – Friday 08:30–18:30, Saturday – Sunday 09:30–17:30 and Monday – Friday 08:30–09:30 & 16:30–18:30.

### **Chalk Farm Road**

- 5.4.107 Pay and display parking bays sufficient for four cars are located on the north eastern side of Chalk Farm Road approximately 70m west of the railway bridge between Hartland Road and Hawley Road. Parking is permitted Monday – Friday 08:30–23:00 and Saturday – Sunday 09:30–23:00 (maximum stay two hours).
- 5.4.108 Further west between Harmood Road and Hartland Road there are additional pay and display parking bays on the north eastern side sufficient for two cars with restrictions as above.
- 5.4.109 Castlehaven Road has a variety of parking bay types located on either side of the road to the east of Leybourne Street junction at around 50m from the Chalk Farm overbridge. These consist of pay and display, car club and motorcycle bays.
- 5.4.110 Time-restricted parking and loading bays sufficient for three cars are located on the western side of Camden High Street to the south of the Camden High Street rail bridge and immediately north of the Jamestown Road junction.

### **Juniper Crescent**

- 5.4.111 The Morrison's supermarket access road is subject to no waiting at any time restrictions. The western section of Juniper Way leading to the proposed worksite compound has 12 private residents bays located on the northern side of the road.

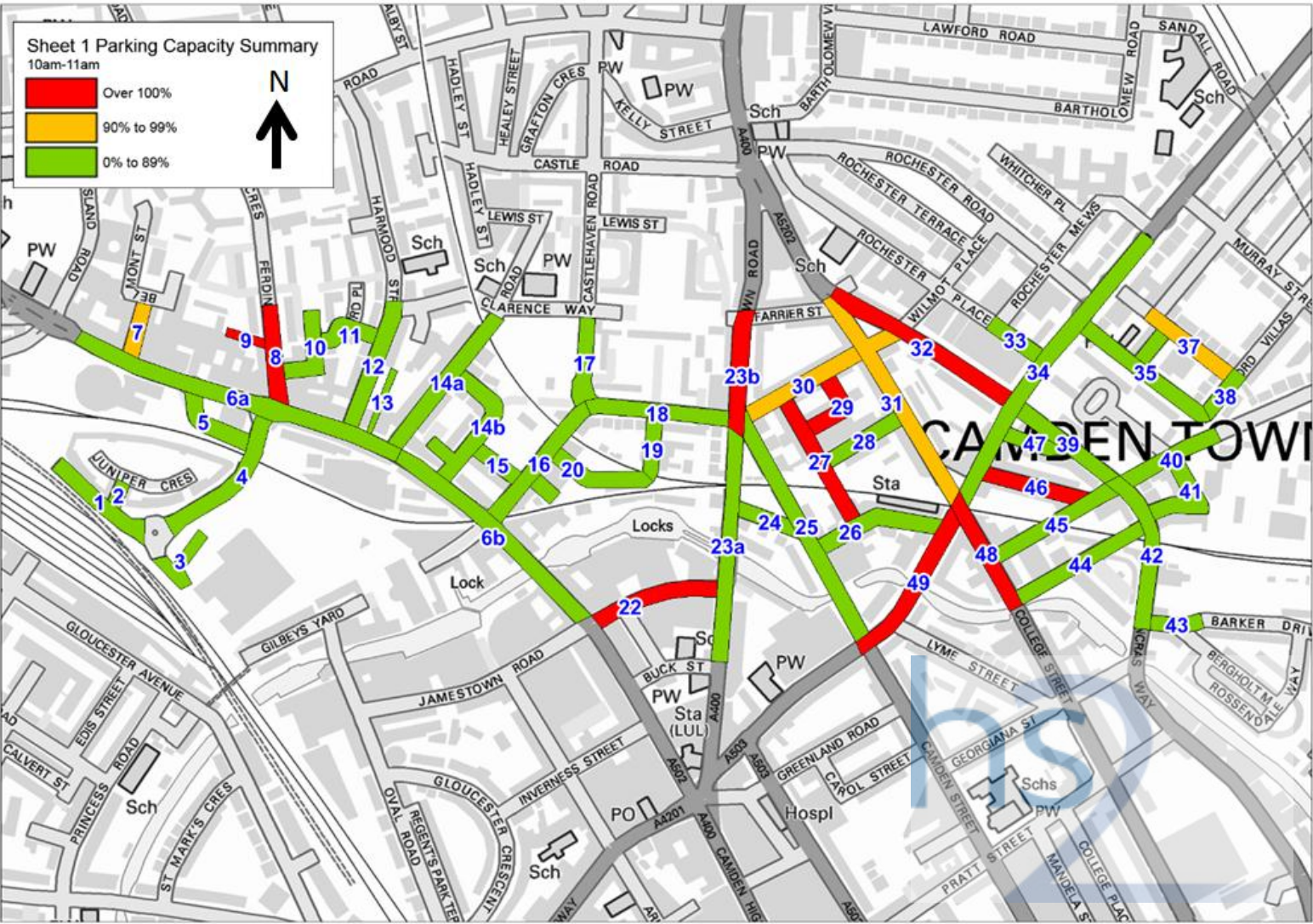
### *Parking occupancy surveys*

- 5.4.112 Parking beat surveys were undertaken in streets close to the Camden Workgroups in July 2012. Surveys were undertaken on Thursday 5 July and Saturday 7 July 2012. The period chosen was pre-school holidays and Olympic Games period. The study dates were chosen to provide a typical weekday and weekend comparison of variation in parking demand. The surveys were undertaken between 05:00 and 22:30.
- 5.4.113 The peak hour demand across both survey days was identified as 10:00–11:00. Summary diagrams showing the levels of parking stress in the area for weekday and weekend peak periods are shown in Figure 5-10 and Figure 5-11.

- 5.4.114 Figure 5-10 shows that for the weekday peak period, parking demand is greatest towards the eastern side of the HS1-HS2 Link area around St. Pancras Way/Camden Road and Camden Street/Kentish Town Road. Specific parking demand issues are located near to Camden Road Rail Bridge and Camden Road viaduct. Generally parking demand within the study area is within capacity, for the periods surveyed.
- 5.4.115 The general pattern of weekend demand shown in Figure 5-11 is much less than that shown in the weekday survey. It can be seen that demand around Prowse Place remains greater than the available capacity.



Figure 5-10: Camden and HS1 Link - weekday peak (10:00 – 11:00) parking demand summary





**Sheet 1 Parking Capacity Summary Weekend**  
10am-11am

- Over 100%
- 90% to 99%
- 0% to 89%

**Map Details:**

- Legend:** Red indicates parking capacity over 100%, orange indicates 90% to 99%, and green indicates 0% to 89%.
- North Arrow:** Points North (N).
- Streets:** Major roads include Grafton Cres, Castle Road, Lewis St, Clarencemore Rd, Farrier St, Rochester Road, Rochester Terrace, Wilmo Place, Rochester Mews, Sandall Road, Lawford Road, Bartholomew Road, Whitchee Pl, Rochester Place, Wilmo Place, Rochester Mews, Sandall Road, Lawford Road, Bartholomew Road, Whitchee Pl, Rochester Place, Wilmo Place, Rochester Mews.
- Landmarks:** Includes schools (Sch), police stations (PW), a station (Sta), a hospital (Hospl), and a post office (PO).
- Capacity Data:** Numbered points on the map indicate specific parking capacity values. Red areas (over 100%) are located near the station and the hospital. Orange areas (90% to 99%) are located near the station and the hospital. Green areas (0% to 89%) cover most of the map.



## Public transport

- 5.4.116 The study area is well served by public transport, with numerous rail, LU, London Overground, bus and coach connections. The following sections describe the rail, bus and coach services in the area.

### Rail network

- 5.4.117 The main line station is at Euston to the south of the HS1-HS2 Link study area with other London Overground and LU stations providing access to national and local rail services.
- 5.4.118 Camden Town London Overground station is located on Camden Road and falls within the St. Pancras Way to Camden Road area. Chalk Farm LU station lies to the west of the Camden Street to Kentish Town Road area. Camden Town LU station is to the south of all areas of assessment in this CFA and further south is Mornington Crescent LU station.
- 5.4.119 Estimated rail passenger station entry and exit flows have been derived from Network Rail (NR) and London Underground Limited (LUL) information and are summarised in Table 5-43 below.

Table 5-43: Camden and HS1 Link – local station entry exit counts

Station name	Station type	Estimated 3hr AM peak (07:00-10:00)	Estimated annual entries and exits (2010/11)
Camden Road	Overground	1,726	1,833,296
Camden Town	LUL	19,761	20,985,400
Mornington Crescent	LUL	4,051	4,302,147
Kentish Town West	Overground	677	719,392
Chalk Farm	LUL	4,650	4,937,923

Source: Various, including NR and LUL.

### Local bus services

- 5.4.120 The local bus network is shown on Figure 5-12.

#### St. Pancras Way to Camden Road

- 5.4.121 The northern section of St. Pancras Way between Royal College Street and Agar Grove carries route 274 towards Islington Angel. Baynes Street is on the 274 route towards Lancaster Gate. In addition, a university bus route (UL1) passes through the area via Baynes Street.
- 5.4.122 Bus stop P on St. Pancras Way is the closest bus stop to the St. Pancras Way/Baynes Street rail bridge. There are no bus stops on Baynes Street.

- 5.4.123 Randolph Street is not on any bus route. Bus services 46 and 274 run close to this site along Royal College Street. Bus stop H on Royal College Street serves routes 46 and 274 and bus stop P on St. Pancras Way serves only route 274.
- 5.4.124 Bus services 29, 253, 274 and night buses N29, N253 and N279 run on Camden Road and Royal College Street carries bus services 46 and 274.
- 5.4.125 The closest bus stops to the rail Camden Road/Royal College Street bridge are bus stops F and G on Camden Road and bus stops B and H on Royal College Street.
- 5.4.126 Table 5-44 shows bus routes and frequencies for the St. Pancras Way (there are no bus routes near Randolph Street). Information is derived from TfL bus information.

Table 5-44: St. Pancras Way / Baynes Street area bus frequencies

St. Pancras Way/ Baynes Street Rail Bridge	AM peak (buses/ hr)	Inter-peak (buses/hr)	PM peak (buses/ hr)
274	8	8	8

- 5.4.127 Table 5-45 shows bus routes and frequencies for Camden Road rail bridge area.

Table 5-45: Camden Road Rail Bridge area bus frequencies

Camden Road Rail Bridge	AM peak (buses/hr)	Inter-peak (buses/hr)	PM peak (buses/ hr)
29	8	8	8
46	6	6	6
253	12	12	12
274	8	8	8

### Camden Street to Kentish Town Road

- 5.4.128 Camden Street carries the following services: 24, 27, 31, 46, 134, 168, 214 and C2 of which all are 24 hour services except routes 46 and 168. In addition night services N5, N20, N28 and N31 operate on Camden Road.
- 5.4.129 Bus stop D is located immediately south of the rail bridge on Camden Street and is served by approximately 104 buses per morning peak hour (08:00-9:00).

Figure 5-12: Bus routes serving Camden Town and surrounds



- 5.4.130 Kentish Town Road carries the following bus services: 134, 214, 46 and C2 all operate 24 hours in addition to the N20 night bus. Bus stop A on Kentish Town Road is served by Routes 134, 214, C2 and N20 and is located directly beneath the Kentish Town Road rail bridge. Table 5-46 & Table 5-47 show the routes and frequencies in Camden Street to Kentish Town Road area.

Table 5-46: Camden Street Rail Bridge area bus frequencies

Camden Street rail bridge	AM peak (buses/ hr)	Inter-peak (buses/ hr)	PM peak (buses/ hr)
46	6	6	6
31	15	15	15
168	20	20	20
214	10	10	10
C2	8	12	12
134	20	20	12
24	12	12	12
27	12	12	12

Table 5-47: Kentish Town Road area bus frequencies

Kentish Town Road rail bridge	AM peak (buses/ hr)	Inter-peak (buses/ hr)	PM peak (buses/ hr)
134	20	20	12
C2	8	12	12
214	10	10	10

### Chalk Farm Road to Primrose Hill tunnel portal

- 5.4.131 A number of bus services operate along Chalk Farm Road: 24, 27, 31, 168 and 393 of which the 24 and 27 operate 24 hours in addition to night buses N5, N28 and N31. Bus stops CQ, CE, CB and CF on Chalk Farm Road serve these buses.
- 5.4.132 Bus service 27 operates a 24-hour service to Morrison's supermarket via Juniper Crescent. Other bus services that operate close to the rail bridge run along Chalk Farm Road are the numbers 31, 168 and 24.
- 5.4.133 A bus stop serving route 27 is located within the grounds of Morrison's supermarket.
- 5.4.134 Table 5-48 and Table 5-49 show the routes and frequencies Chalk Farm Road to Primrose Hill area.

Table 5-48: Chalk Farm Road area bus frequencies

Chalk Farm Road rail bridge	AM peak (buses/ hr)	Inter-peak (buses/ hr)	PM peak (buses/ hr)
31	15	15	15
168	20	20	20
24	12	12	12
27	12	12	12

Table 5-49: Juniper Crescent (Morrison's Access) area bus frequencies

Juniper Crescent rail bridge	AM peak (buses/ hr)	Inter peak (buses/ hr)	PM peak (buses/ hr)
27	12	12	12
393	5	5	5

### *Coach services*

- 5.4.135 There are no dedicated coach service facilities in the vicinity of the Camden Town and HS1 Link study area.

### *Taxis*

- 5.4.136 There are no major dedicated taxi facilities on the public highway in the vicinity of the Camden Town and HS1 Link study area. However, this does not preclude the ability pick-up and set down in these areas. Morrison's supermarket does have a pick up point within its store site.

### *Public transport interchanges*

- 5.4.137 Euston main line station lies to the south of the HS1-HS2 Link within the CFA2 study area.
- 5.4.138 Interchange with Chalk Farm underground station is obtained via bus stops CA eastbound and CB westbound at the eastern end of Adelaide Road and bus stops CC northbound and CD southbound on Haverstock Hill
- 5.4.139 Interchange with Camden Town London Overground is obtained via bus stop G northbound on Camden Road south of Bonny Street junction and bus stop F southbound on Camden Road north of Rousden Street junction. Interchange with Camden Town London Overground is also possible via undesignated bus stops northbound on Royal College Street south of Ivor Street junction and northbound on Royal College Street opposite Randolph Street.

### *Pedestrians, cyclists and equestrians*

- 5.4.140 The following section describes the pedestrian and cycle facilities in the study area.

- 5.4.141 As well as on the approaches to the stations, pedestrian activity in vicinity of the Chalk Farm Road rail bridge is high due to the concentration of retail shops and markets. There are no PRowS in the vicinity of the sites.

### *Pedestrian facilities*

#### **St. Pancras Way/Baynes Street**

- 5.4.142 There are no designated crossing points close to the St. Pancras Way/Baynes Street rail bridge. However, there is a splitter island at the St. Pancras Way/Baynes Street junction that segregates the cycle lane from the traffic which pedestrians may use to cross St. Pancras Way. The Grand Union Canal towpath can be accessed via steps from the western end of Baynes Street. A zebra crossing is located on Royal College Street immediately south of its junction with Baynes Street.

#### **Randolph Street**

- 5.4.143 An existing two-way cycle lane runs between Randolph Street and Georgiana Street on St. Pancras Way. The cycle lane is on carriageway but is segregated from traffic by a splitter island. There is a raised entry treatment at the junction of Randolph Street with Royal College Street.
- 5.4.144 Push button pedestrian crossing facilities are located at the Randolph Street/St. Pancras Way/Agar Grove traffic signalised junction.

#### **Prowse Place**

- 5.4.145 Prowse Place has minimal footway provision at around 0.5metre width for most of its length on either side of a cobbled sett carriageway.

#### **Camden Street/Kentish Town Road**

- 5.4.146 The Hawley Road/Kentish Town Road/Camden Street junction is a signalised intersection with push button facilities. There are no other crossing points in the vicinity of the rail bridge.

#### **Chalk Farm Road**

- 5.4.147 Pedestrian activity in vicinity of the rail bridge is high due to the concentration of retail shops and markets. The junction of Chalk Farm Road with Camden High Street and Castlehaven Road is signalised with push button facilities. A zebra crossing is located approximately 60m west on the rail bridge on Chalk Farm Road. The junction of Camden High Street with Hawley Crescent and Jamestown Road is signalised with push button facilities. The nearest pedestrian crossing point to the Chalk Farm rail bridge is provided at the Juniper Crescent/Chalk Farm Road signalised junction.

## **Juniper Crescent**

- 5.4.148 There is a zebra crossing on the Morrison's supermarket access road leading to Juniper Crescent. The crossing is situated prior to the roundabout leading to Juniper Crescent and Morrison's supermarket.

### *Non-motorised user flows*

- 5.4.149 A summary of pedestrian flows within the core study area is illustrated in Figure 5-13 and Figure 5-14 below. The figures show the AM peak hour pedestrian flows derived from the data contained in the Baseline Survey Report in Annex B(ii).



Figure 5-13: Camden and HS1 Link - pedestrian flows east

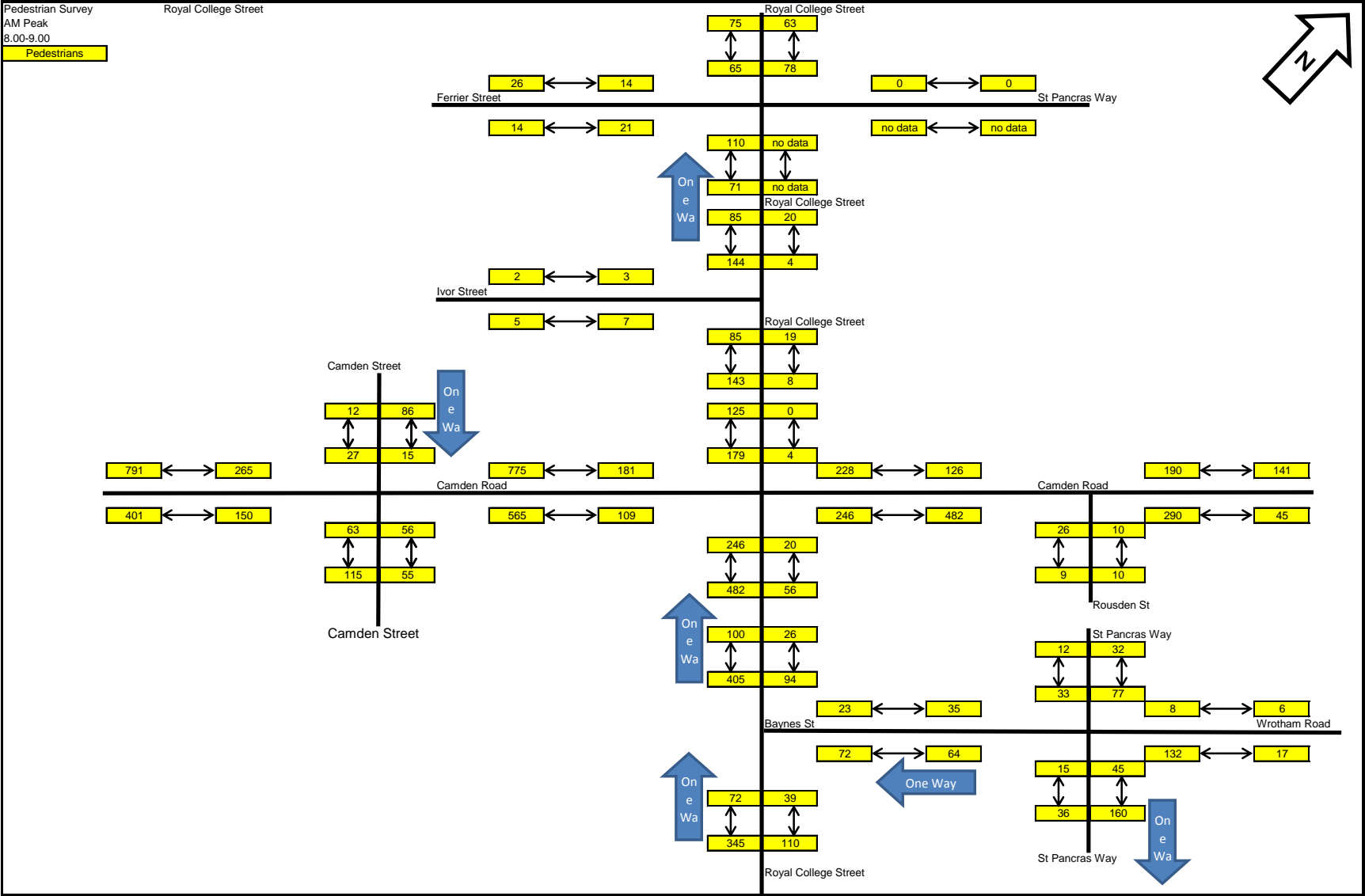
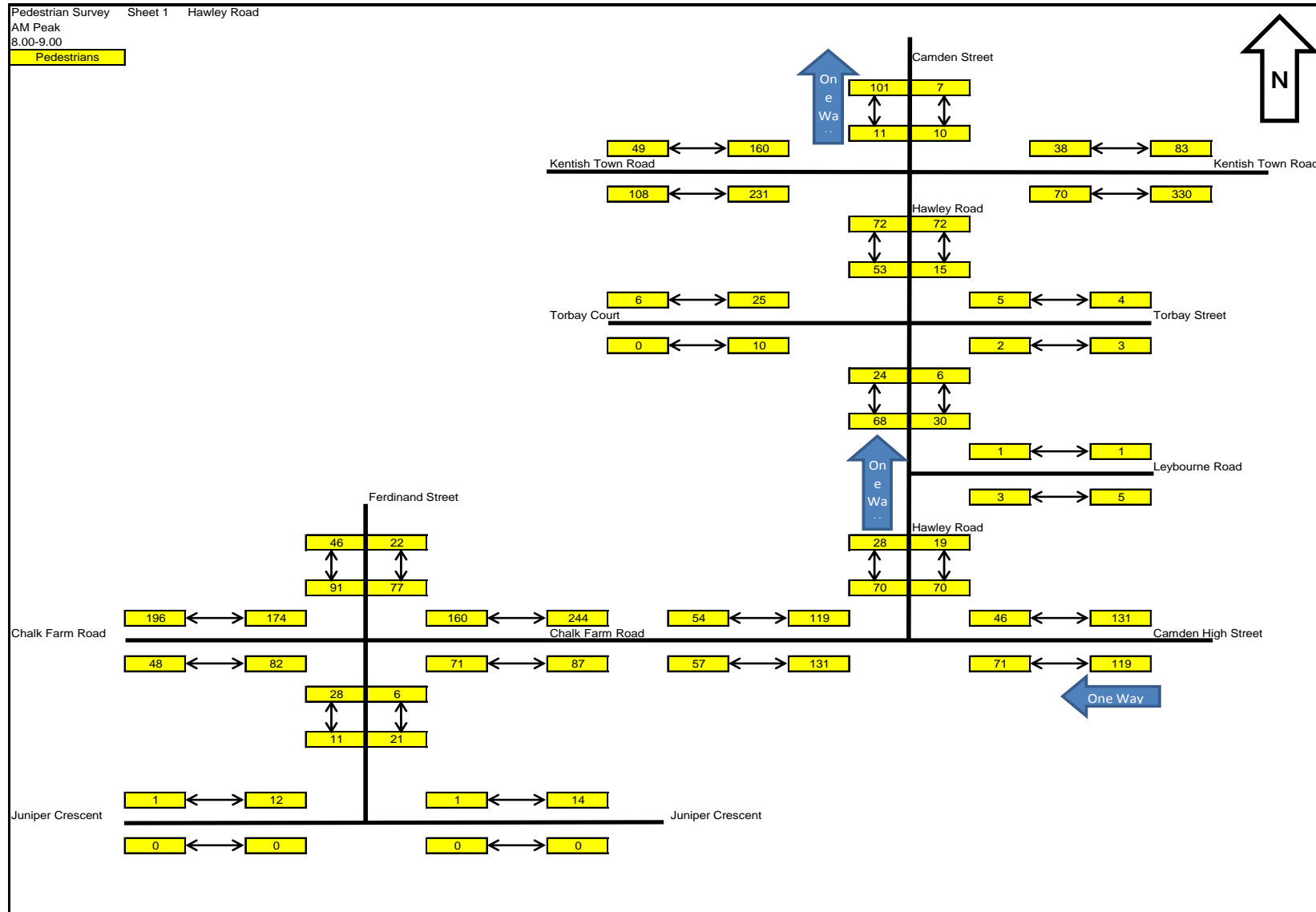


Figure 5-14: Camden and HS1 Link - pedestrian flows west



### *Cycle Facilities*

5.4.150 Several streets within the study area form part of the London Cycle Network, including Randolph Street, St. Pancras Way, Royal College Street, Pratt Street, Castlehaven Road, Hawley Road and Georgiana Street.

5.4.151 Specific cycle routes and facilities within the study area include:

#### **St. Pancras Way/Baynes Street**

5.4.152 Baynes Street is recognised by TfL as a quieter road recommended for cyclists. Baynes Street connects with Royal College Street which is a signed cycle route.

#### **Randolph Street**

5.4.153 Randolph Street is recognised by TfL as a route suitable for use by cyclists. It connects with the routes on Royal College Street and St. Pancras Way which are signed cycle routes.

#### **Camden Road**

5.4.154 Camden Road is not a designated cycle route, however there are several cycle routes on nearby streets in the area. Seven cycle stands are located at the junction of Royal College Street and Camden Road.

#### **Prowse Place**

5.4.155 Prowse Place is recognised by TfL as a route suitable for use by cyclists.

#### **Camden Street / Kentish Town Road**

5.4.156 A small section of Kentish Town Road south of the rail bridge between Hawley Crescent and Camden Gardens is recognised by TfL as a quieter road recommended for use by cyclists.

#### **Chalk Farm Road**

5.4.157 Chalk Farm Road is a quieter road recommended for cyclists that connects to signed cycle routes. Castlehaven Road which connects with Chalk Farm Road is a signed cycle route.

5.4.158 A Barclays Cycle Hire docking station sufficient for storing 29 cycles is located on the northern side of Castlehaven Road between Camden High Street and Leybourne Street. This is around 20m east of the Chalk Farm Road Bridge site. Seven cycle stands are also located at the junction of Castlehaven Road and Chalk Farm Road.

5.4.159 Cycle advanced stop lines are provided at the Chalk Farm Road / Camden High/Castlehaven Road junction.

## Juniper Crescent

- 5.4.160 Part of the Morrison's supermarket access road is recognised by TfL as a road recommended for cyclists.

## Regent's Park Road

- 5.4.161 A westbound contra-flow cycle lane runs along Regent's Park Road which is a quieter road recommended for cyclists that connects to signed routes.
- 5.4.162 The Barclays Cycle Hire docking stations in the CFA2 study area are shown in Figure 5-15.

Figure 5-15: Camden and HS1 Link - Barclays Cycle Hire docking station locations



- 5.4.163 The cycle network within the study area is shown in Figure 5-16.

## Equestrian facilities

- 5.4.164 There are no dedicated equestrian facilities in the vicinity of the Proposed Scheme within the CFA2 study area.

## Waterways/canals

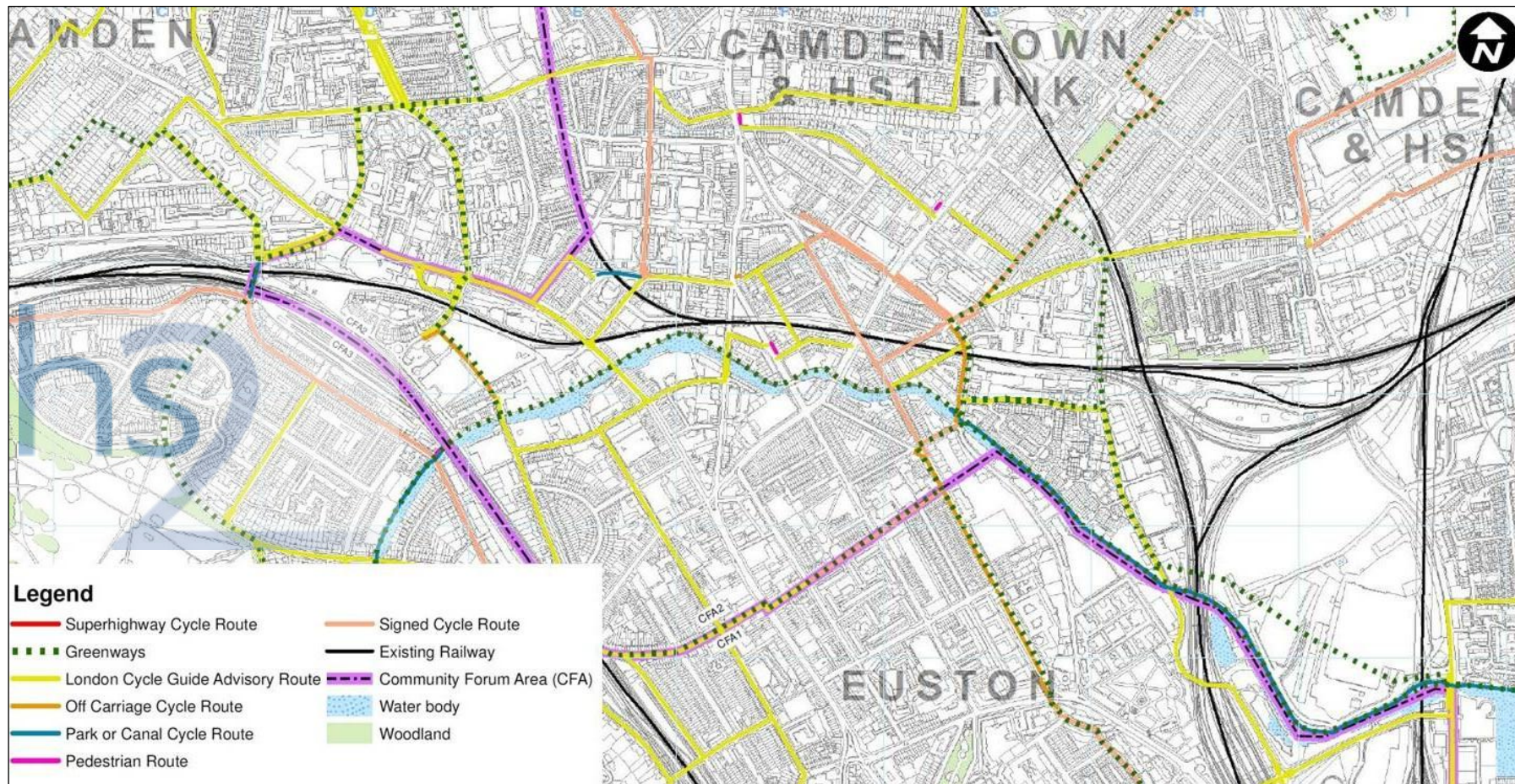
- 5.4.165 The Regent's Canal passes close to the Proposed Scheme in the study area running in an east-west direction to the immediate south of the study area.

## Air transport

- 5.4.166 There are no airports in the vicinity of the Proposed Scheme within the study area.



Figure 5-16: Cycle routes within Camden and HS1 Link



## 5.5 Primrose Hill to Kilburn (Camden) (CFA3)

### Study area

- 5.5.1 This section provides an overview of the baseline traffic and transport conditions for the section of the Proposed Scheme that passes through the Primrose Hill to Kilburn (Camden) CFA.
- 5.5.2 It describes the transport infrastructure within the CFA, which would be affected either by the construction or the operation of the Proposed Scheme. For this area, the baseline conditions relate to the transport network affected by construction of tunnel vent shafts at Adelaide Road and Alexandra Place along with the operational impacts of the Proposed Scheme.
- 5.5.3 The scope of work and study area has been discussed with the key transport authorities including TfL and the LBC. The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFA3 Report), the core study area within the CFA boundary and the main road network can be seen in Figure 5-17 below.
- 5.5.4 For ease of reference, the baseline transport conditions for each mode are generally described from east to west along the proposed route.

### Local land uses

#### *Adelaide Road*

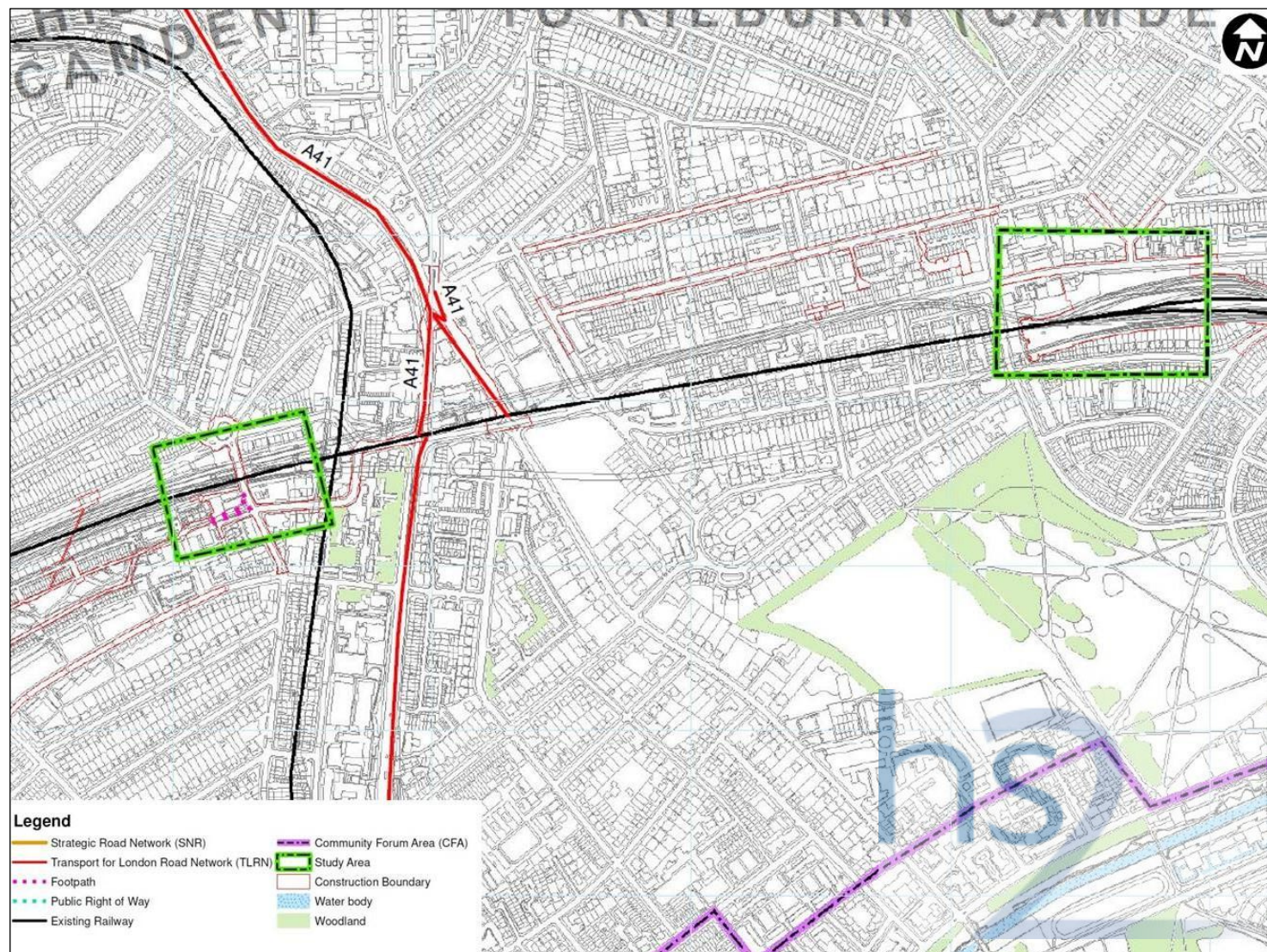
- 5.5.5 The proposed route alignment through the Adelaide Road area passes through predominantly residential (C3) and non-residential (D1 medical centre). Construction works are proposed within rail cutting to the southern side of Adelaide Road.

#### *Alexandra Place*

- 5.5.6 Alexandra Place is a minor residential access road which connects with Loudoun Road. Land use in the vicinity of Alexandra Place is predominantly residential (C3), along with a mix of retail (A1) and café/take-away (A3/A5) land uses.



Figure 5-17: Primrose Hill to Kilburn (Camden) study area



## Surveys

- 5.5.7 Traffic, non-motorised user and station surveys were undertaken in the three-weeks between 18 June-6 July 2012 during a period which avoided the effect of the Hammersmith Flyover emergency closure, National holidays (including the Queen's Jubilee and Royal Wedding) and also the Olympics & Paralympics period. Non-motorised user and station surveys were undertaken in September 2012. The survey locations are shown within the Baseline Survey Report in Annex B(ii).

### *Traffic surveys*

- 5.5.8 The traffic surveys comprised:
- MCC at highway junctions. Surveys were undertaken on a weekday between 07:00 and 10:00; 11:00 and 14:00; and 16:00 and 19:00 and on a Saturday between 10:00 and 14:00;
  - traffic signal staging; green time, intergreen and cycle time data was obtained from TfL. Saturation flow surveys at signal controlled junctions were undertaken for the same time periods as the MCCs; and
  - ATC on highway links across the study area. Wherever possible ATC data was gathered for a continuous two week period to coincide with the date of the MCCs. Parking accumulation within the vicinity of the planned worksites was recorded from 05:00 to 22:30 at 30-minute intervals on a weekday and at the weekend.

### *Non-motorised user surveys*

- 5.5.9 Pedestrian flow surveys were undertaken at junctions in parallel with the MCC surveys and on all roads and associated footways intersected by the Proposed Scheme. There are no PRow in the area.
- 5.5.10 The August and September surveys were carried out between 08:00 and 18:00 on a weekend to capture leisure users. The September surveys were undertaken on a weekday between 07:00-10:00, 11:00-14:00 and 16:00-19:00 to capture school and commuting users.
- 5.5.11 Surveys were undertaken in August and September on a Saturday and / or Sunday between 08:00 and 18:00, to reflect the peak movement demands along these routes. In addition, surveys were conducted on a weekday during September with a view to capturing 'commuter' movements on those routes which serve areas which may be used for purposes other than leisure and recreation.

### *Station surveys*

- 5.5.12 Pedestrian surveys were carried out at South Hampstead Overground station. Survey data contained within Baseline Survey Report in Annex B(ii).



## Highway network

- 5.5.13 The following section describes the roads within the study area. The main local roads in the study area that are affected by the Proposed Scheme are B509 Adelaide Road, Alexandra Place, St John's Wood Park, Prince of Wales Road, Ferdinand Street, Gloucester Avenue, A502 Haverstock Hill, B507 Abbey Road, Albert Terrace, A41 Finchley Road, Primrose Hill Road, England's Lane, Regent's Park Road, A502 Chalk Farm Road, Avenue Road, Regent's Park Road, A4201 Parkway and A502 Rosslyn Hill.
- 5.5.14 The A41 Finchley Road, part of the TLRN is the main strategic route in the area and connecting to the A40. Survey and model data indicates that the A41 is particularly prone to congestion in peak weekday periods.

## Strategic road network

### Motorway network

- 5.5.15 The M40/M25 junction is located approximately 23.5km to the west of the Primrose Hill to Kilburn Community Forum area, while the southernmost end of the M1 at Hendon is located 4.7km to the north and the easternmost end of the M4 at Chiswick is located some 8km to the south west.

### 'A' roads

- 5.5.16 The A41 Finchley Road, part of the TLRN is the main strategic route in the area and connecting to the A40.

#### *Adelaide Road*

- 5.5.17 Adelaide Road connects the A502 Haverstock Hill/Chalk Farm Road at its eastern end to A41 Finchley Road, which is on the TLRN to the west. It commences from Oxford Street in the south and connects with the A1/M1 at Hendon for onward connections to the M25 and other destinations to the north.

#### *Alexandra Place*

- 5.5.18 Alexandra Place is west of Adelaide Road and is approximately 270m west of the A41 Finchley Road.

## Local road network

### Adelaide Road

- 5.5.19 Adelaide Road is a single carriageway, two-way road connecting the A41 Finchley Road in the west to the A502 Haverstock Hill/Chalk Farm Road in the east. Traffic-calmed 20mph zone is located in streets to the north of the Eton Road, Steel's Road and Fellows Road.

## Alexandra Place

- 5.5.20 Alexandra Place is a minor residential access road. Broadly a crescent in shape, it is one-way working from south to north and connects with Loudoun Road at either end. This section of Loudoun Road is a single-carriageway, two-way road which is also a signed cycle route. The boundary with the City of Westminster lies some 100m further south, running east-west along Boundary Road.

### Baseline conditions

- 5.5.21 This section examines baseline traffic flows on the strategic and local highway network.

Table 5-50: Primrose Hill to Kilburn (Camden) 2012 baseline flows

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
Primrose Hill Road (south of Adelaide Road)	Northbound	341	15	382	6
	Southbound	640	31	370	6
Avenue Road (south of B509 Adelaide Road)	Northbound	276	10	508	4
	Southbound	885	22	639	7
A41 Finchley Road (south of B503 Adelaide Road)	Northbound	618	52	724	40
	Southbound	841	65	507	32
Loudoun Road (south of Alexandra Place)	Northbound	542	10	425	6
	Southbound	314	11	392	5
A507 Abbey Road (south of B509 Belsize Road)	Northbound	310	8	538	9
	Southbound	568	15	313	4
A5 Kilburn High Road (south of B509 Belsize Road)	Northbound	558	30	576	16
	Southbound	252	35	499	8

- 5.5.22 The operation of the main junctions which form the main access routes from the strategic network to the Primrose Hill to Kilburn study area sites have been analysed for the 2012 existing conditions and the results are summarised below.

### Alexandra Place A502 Haverstock Hill / A502 Chalk Farm Road / Adelaide Road

- 5.5.23 This is a three-arm signalised intersection with controlled pedestrian crossing facilities on Adelaide Road and western arm of Haverstock Hill. The junction is located outside Chalk Farm underground station. Additional traffic is contributed to Chalk Farm Road from Regent's Park Road and Crogsland Road both adjoining the eastern arm of the junction from the south and north respectively.
- 5.5.24 The eastbound traffic approaching from Haverstock Hill is only allowed to proceed straight ahead, while the traffic approaching from Adelaide Road can only turn right onto Chalk Farm Road towards Camden Town. The two eastbound junction entry lanes on Haverstock Hill are separated by a traffic island. The inner lane is currently marked as a bus lane with an ASL and operates as a bus gate with the outer lane for general traffic to proceed straight ahead. Traffic then has the option to continue straight ahead or to turn left into Regent's Park Road. From Chalk Farm Road the westbound traffic can either turn left into Adelaide Road or carry on straight up Haverstock Hill.
- 5.5.25 Bus routes 168 and 393 travel between Haverstock Hill and Chalk Farm Road. The route 31 travels along Adelaide Road and Chalk Farm Road.
- 5.5.26 Table 5-51 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated CLOHAM model.

Table 5-51: 2012 baseline performance at junction Haverstock Hill / Chalk Farm Road / Adelaide Road (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Haverstock Hill	321	16	2
Chalk Farm Road	531	20	1
Adelaide Road	624	53	7
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Haverstock Hill	329	17	3
Chalk Farm Road	449	17	1
Adelaide Road	652	55	7

- 5.5.27 The model shows that this junction operates within its capacity in AM and PM peak hours. Haverstock Hill and Chalk Farm Road accommodate the flows with minimal queues. Adelaide Road has a slightly greater traffic flow and thus a longer queuing length.

## Primrose Hill Road/Adelaide Road

5.5.28 This junction is a four-arm signalised intersection with controlled pedestrian crossing facilities on all arms which are single-lane two-way roads. Primrose Hill Road runs in the north-south direction and Adelaide Road in the east-west direction. ASLs are featured on the approach arms. Two bus routes travel through the junction, the 31 travels the entire length of Adelaide Road and the C11 uses the western arm of Adelaide Road and the northern arm of Primrose Hill Road.

5.5.29 Table 5-52 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated CLOHAM model.

Table 5-52: 2012 baseline performance at junction Primrose Hill Road/Adelaide Road (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Primrose Hill Road (SB)	655	75	7
Adelaide Road (WB)	444	53	5
Primrose Hill Road (NB)	357	49	4
Adelaide Road (EB)	721	83	8
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Primrose Hill Road (SB)	368	43	4
Adelaide Road (WB)	330	40	3
Primrose Hill Road (NB)	390	55	4
Adelaide Road (EB)	693	78	7

5.5.30 The model shows that the junction as a whole performs within its capacity, but the western arm of Adelaide Road is operating close to capacity during both AM and PM peak hours. The western arm of Adelaide Road experiences the highest level of queues both in the AM and PM peak hour, since it carries the greatest volume of traffic in both time periods.

## Avenue Road/Adelaide Road

5.5.31 This is a major four-arm signalised intersection located at the eastern corner of A41 Finchley Road – A41 Avenue Road – A41 Adelaide Road triangular gyratory to the south of Swiss Cottage Underground station. The gyratory is part of the TLRN. Adelaide Road crosses the junction in the east-west direction and Avenue Road runs in the north-south direction. The eastern arm of Adelaide Road is two-way and the western arm a six lane one-way carriageway running westbound. The northern arm of A41 Avenue Road is a one-way carriageway operating southbound with its southern arm two-way. Pedestrian crossing facilities are provided on all arms with no provisions for cyclists. Bus routes 13, 31, 82, 113, 168, C11 and DF2 travel through the junction.

5.5.32 Table 5-53 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated CLOHAM model.

Table 5-53: 2012 baseline performance at junction Primrose Hill Road/Adelaide Road (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Avenue Road (SB)	2,542	46	8
Adelaide Road (WB)	758	33	9
Avenue Road (NB)	288	19	3
Adelaide Road (EB)	N/A	N/A	N/A
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Avenue Road (SB)	2,112	40	7
Adelaide Road (WB)	609	27	7
Avenue Road (NB)	516	33	6
Adelaide Road (EB)	N/A	N/A	N/A

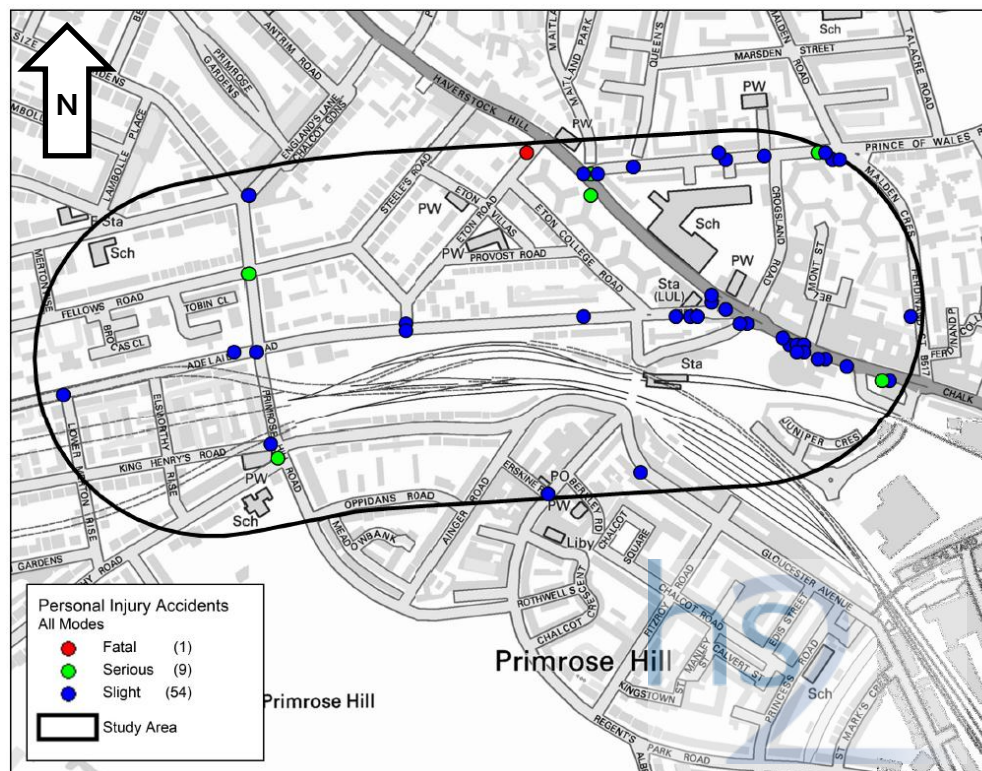
5.5.33 The junction performs well within capacity during both AM and PM peak hours. Avenue Road carries higher overall traffic volumes.

## Accidents and safety

5.5.34 Accident data covering a 36-month period to the end of March 2012 was obtained from TfL and the analysed information is presented below.

## Adelaide Road

Figure 5-18: Adelaide Road - location, number of accidents and severity for all users



5.5.35 Figure 5-18 shows most accidents during the 36-month period studied have occurred along A502 Haverstock Hill and Chalk Farm Road to the east of the junction with Adelaide Road with the remainder generally spread across the area.

5.5.36 Most accidents involving pedestrians and cyclists also occurred along the A502 Haverstock Hill and Chalk Farm Road. The only cluster is in the vicinity of The Roundhouse on Chalk Farm Road where several accidents have taken place in the vicinity of the junction with Belmont Street and/or an uncontrolled pedestrian crossing opposite The Roundhouse.

5.5.37 Table 5-54 shows the level of accidents recorded in the vicinity of Adelaide Road.

Table 5-54: Accident records – Adelaide Road

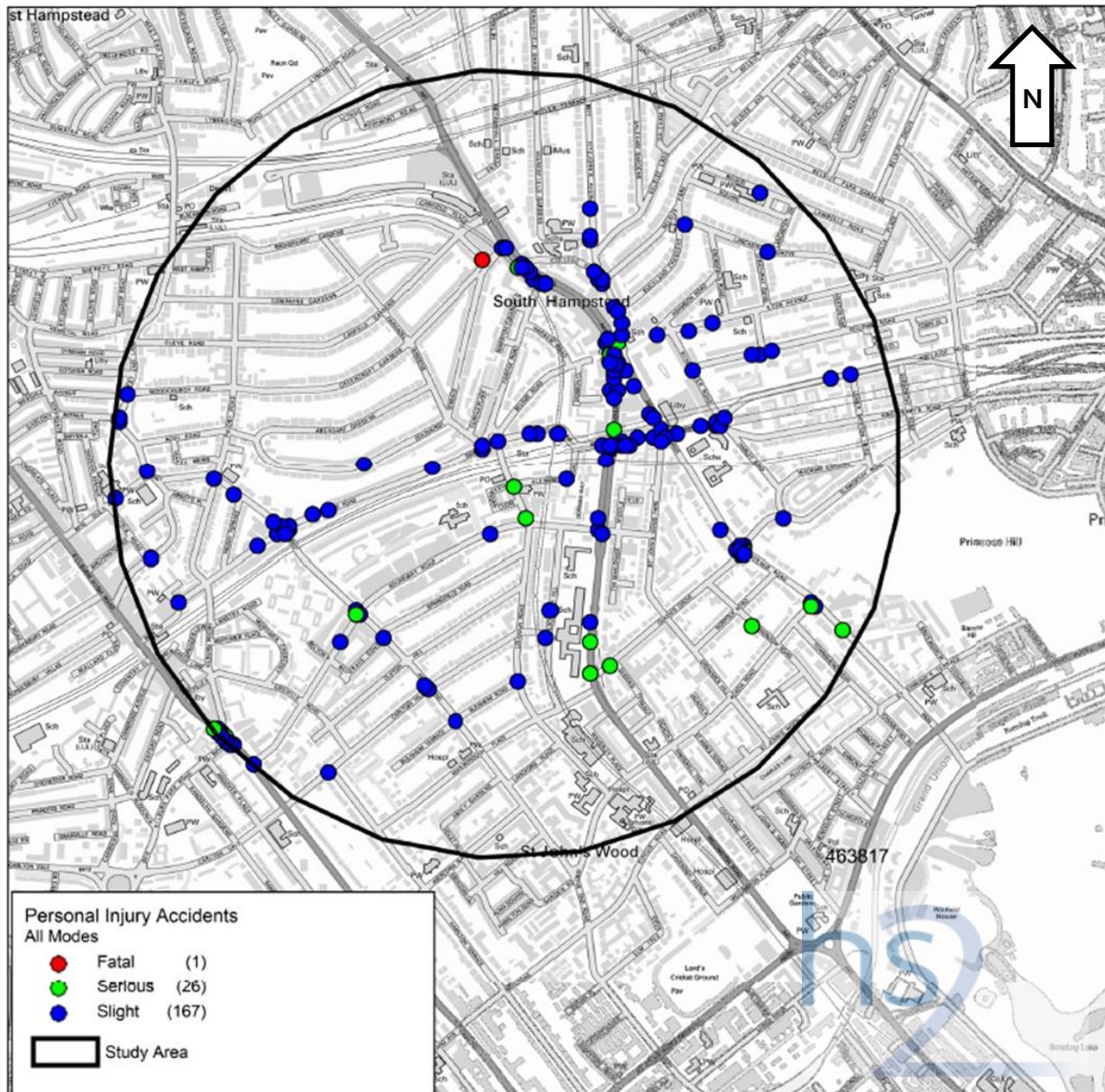
Area	Fatal	Serious	Slight	Total Accidents
CFA3 – Adelaide Road	1	9	54	64
Mean PIA per annum	0.3	3	18	21.3



## Alexandra Place

5.5.38 Figure 5-19 shows that the greatest concentration of accidents in the area has occurred around the Swiss Cottage gyratory with clusters along A41 Finchley Road, Belsize Road, Abbey Road and Avenue Road. At least one serious personal injury accident has been recorded at the Loudoun Road junction with Alexandra Road/Alexandra Place.

Figure 5-19 Alexandra Place – location, number of accidents and severity for all users



5.5.39 Table 5-55 below shows the level of accidents recorded in the vicinity of Alexandra Place.

Table 5-55: Accident records – Alexandra Place

Area	Fatal	Serious	Slight	Total Accidents
CFA3 – Alexandra Place	1	26	167	194

Area	Fatal	Serious	Slight	Total Accidents
Mean PIA per annum	0.3	8.7	55.7	6.7

### Parking and loading

5.5.40 This section describes the parking controls in the vicinity of the Proposed Scheme and presents the results of the parking accumulation surveys undertaken in 2012.

5.5.41 The general pattern of weekend demand was recorded as much less than shown in the weekday survey.

### Adelaide Road

#### Adelaide Road parking controls

5.5.42 Adelaide Road lies within Camden Controlled Parking Zone (CPZ) CA-B Belsize. Outside of designated bays and double yellow line 'no waiting at any time restrictions', parking on single yellow lines is prohibited from Monday – Friday 09:00–18:30 and Saturday 09:30–13:00.

5.5.43 A 'no waiting by buses or goods vehicles over 5T mgw (maximum gross weight) 18:30–00:00, 00:00–06:00' applies to Adelaide Road.

5.5.44 The northern side of Adelaide Road opposite the site has double yellow line 'no waiting at any time restrictions'.

5.5.45 While there are no parking bays in the immediate vicinity, a number of pay & display bays are located on the southern side of Adelaide Road to the east and west of the site.

5.5.46 Permit parking bays sufficient to hold around 16 cars are located on the southern side of Adelaide Road to the east of the site.

5.5.47 Pay & display bays are located on southern side of Adelaide Road to the west of the Eton Road junction. There is sufficient space for 11 cars. This group of bays incorporates a single disabled bay outside Adelaide Road Medical Centre.

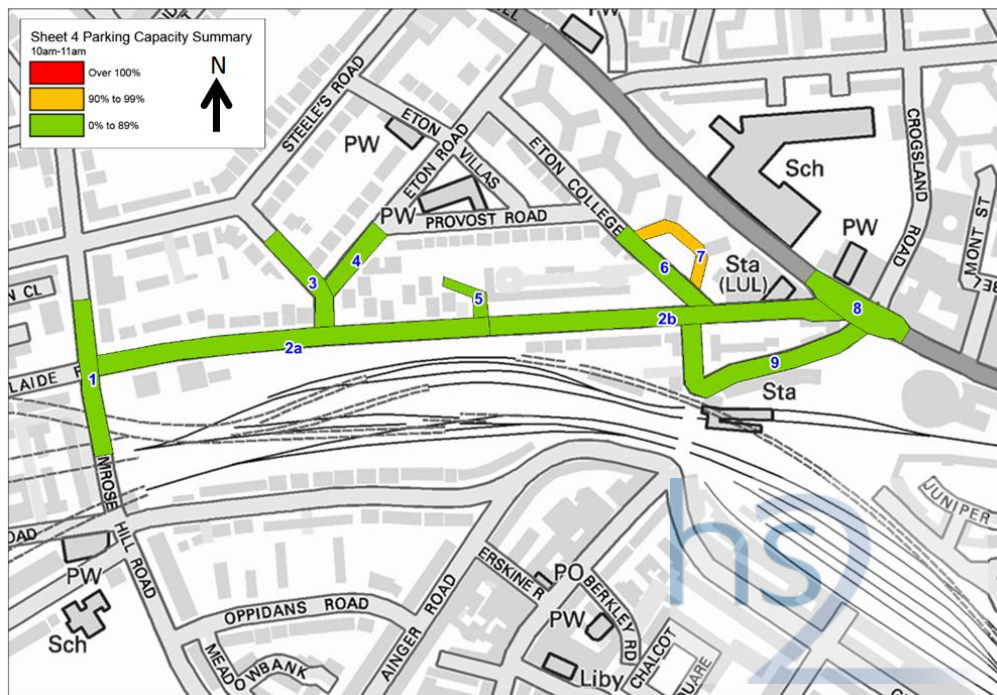
5.5.48 Parking provision on the northern side of Adelaide Road is confined to the east of the site where pay and display bays sufficient for seven cars are located immediately west of the Eton College Road junction. Immediately adjacent to this are permit parking bays sufficient for four cars.



## Adelaide Road parking surveys

- 5.5.49 Parking surveys were undertaken on 10 sections of streets in the Adelaide Road area on Thursday 5 July and Saturday 7 July 2012, dates which avoided school holiday and Olympic Games periods. The sections of street are shown in Figure 5-20 below. The dates were chosen to provide a typical weekday and weekend comparison of variation in parking demand. Results indicate that there are no existing parking capacity problems on Adelaide Road in close proximity to the Adelaide Road works.

Figure 5-20 Adelaide Road area parking survey location plan



- 5.5.50 Eaton College Road and Bridge Approach have an occupancy level higher than 90% during the evening and night during the non-restricted times.
- 5.5.51 Weekday parking demand to the western side of Adelaide Road showed little variance between parking demand during the restricted and unrestricted periods. To the eastern section of Adelaide Road weekday demand followed a broadly similar pattern to that of the western side.
- 5.5.52 Parking demand levels on the weekend morning were recorded as significantly lower in comparison to the recorded weekday levels. However, weekend parking demand increased significantly during the evening between 20:00–22:30.

## Alexandra Place

### Alexandra Place parking controls

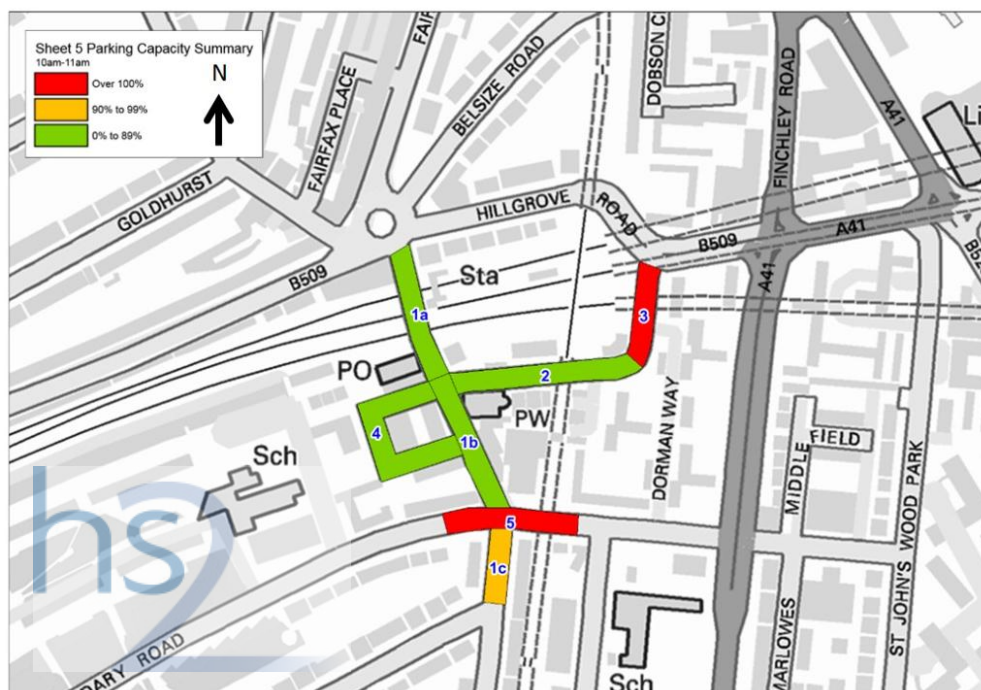
- 5.5.53 Alexandra Place lies within LBC Controlled Parking Zone CA-K. Outside of designated bays and double yellow line 'no waiting at any time restrictions', parking on single yellow lines is prohibited from Monday – Friday 08:30–18:30.

- 5.5.54 Alexandra Place has numerous residential parking bays located along the inner side of the crescent. The northern arm of Alexandra Place also has a single car club bay on the inner (southern side) near to the junction with Loudoun Road.
- 5.5.55 The intervening spaces between parking bays on the inner perimeter are subject to a single yellow line restricting waiting by heavy goods vehicles over 5T mgw (maximum gross weight) and buses from 20:30-00:00, 00:00-08:30 and 'no waiting' Monday – Friday 08:30-18:30.
- 5.5.56 Resident, permit holder, pay and display disabled and motorcycle parking bays are located along Loudoun Road in the vicinity of the site.
- 5.5.57 A disabled parking bay and three pay and display bays are located on the western side of Loudoun Road between the two Alexandra Place arms.

### Alexandra Place parking surveys

- 5.5.58 Parking beat surveys were undertaken in streets close to the proposed Alexandra Place vent shaft worksite on Thursday 5 July and Saturday 7 July 2012, dates which avoided school holiday and Olympic Games periods. The sections of street are shown in Figure 5-21 below. The dates were chosen to provide a typical weekday and weekend comparison of variation in parking demand.
- 5.5.59 Full parking survey records showing the demand against capacity for all roads surveyed over the study dates can be seen in Baseline Survey Report in Annex B(ii).

Figure 5-21 Alexandra Place area parking survey location plan



5.5.60 Weekday parking demand in Alexandra Place varied little throughout the day, with capacity observed on two occasions at 100% during the morning peak. The weekend utilisation was recorded as significantly under capacity, not reaching 50% at any time observed.

5.5.61 Of all the surveyed sections, the greatest parking stress was recorded in Alexandra Road and Boundary Road where parking demand consistently outstripped supply.

### **Public transport**

5.5.62 The Primrose Hill to Kilburn area is well served by public transport, with LU, London Overground, bus and coach connections. The following sections describe the rail, bus and coach services in the area.

### *Rail network*

5.5.63 There are no national main line stations in CFA3 but it is served well by both London Overground and LU stations.

### **Adelaide Road**

5.5.64 The Chalk Farm underground station (Northern line) is also located approximately 450m from the Adelaide Road area and Swiss Cottage underground station (Jubilee line) is located within 1.2km. There are no station interchanges in the immediate vicinity.

5.5.65 Kentish Town West Overground station is approximately 1.1km from the Adelaide Road area. Trains to Richmond, Stratford and intermediate stations via London Overground on the North London line operate from Kentish Town West.

### **Alexandra Place**

5.5.66 The Alexandra Place site is located adjacent to and immediately south of South Hampstead London Overground station. The station is accessed via the north-south running Loudoun Road Bridge over the railway lines and the main entrance takes passengers via steps to an island arrangement at platform level.

5.5.67 The Office of Rail Regulation statistics estimate that approximately 5,000,000 passengers travel through the station annually as shown in Table 5-56 below. Trains to Euston, Watford Junction and intermediate stations via London Overground on the Watford (Direct Current) line operate from South Hampstead.

5.5.68 Swiss Cottage underground station (Jubilee line) is approximately 500m to the north east.

Table 5-56: Primrose Hill to Kilburn (Camden) – local station entry exit counts

Station name	Station type	Estimated 3hr AM peak (07:00 – 10:00)	Estimated annual entries and exits (2010/11)
Chalk Farm	LUL	4,650	4,937,923
Swiss Cottage	LUL	6,504	6,906,412
South Hampstead	Overground	467	495,560
Kilburn High Road*	Overground	1,199	1,273,808

Source: Various, including ORR, NR and LUL.

*Local bus services*

- 5.5.69 There are a wide range of bus services operating in the local area. The local bus network serving the core study areas are shown on Figure 5-22 and Figure 5-23.

**Adelaide Road**

- 5.5.70 Adelaide Road carries two daytime bus services; Route C11 between Archway and Brent Cross Shopping Centre and Route 31 between Bayham Street (Camden Town and White City. However, only Route 31 operates along the section of Adelaide Road in the vicinity of the proposed works. Route C11 operates on the section of Adelaide Road to the west of its junction with Primrose Hill Road. Two night bus services, the N31 between White City and Bayham Street (Camden Town) and the N28 between Bayham Street and Mapleton Crescent (Wandsworth) also serve bus stops on Adelaide Road near the proposed site.
- 5.5.71 There are three bus stops in close proximity to Adelaide Road area. Bus stop P is located on the northern side of Adelaide Road some 80m to the west and is served by the eastbound Routes 31, N28 and N31 towards Camden Town. Bus stop R is also located on the northern side approximately 230m east of bus stop P and is served by the same routes as bus stop P. Bus stop T is located on the southern side of Adelaide Road immediately to the east of Eton Road. It is served by Route 31 in the westbound direction towards Shepherd's Bush, N31 towards Clapham Junction and the N28 towards Wandsworth.
- 5.5.72 Shows the frequency of bus services in the Adelaide Road area. The N31 and N28 have two buses per hour running through the night.

Table 5-57: Adelaide Road area bus frequencies

Adelaide Road area	AM Peak (buses/ hour)	Inter Peak (buses/ hour)	PM Peak (buses/ hour)
C11	6	6	6
31	10	10	10

Source: TfL

### **Alexandra Place**

- 5.5.73 Alexandra Place is a minor access road to residential premises and does not form part of any bus route. Likewise the connecting Loudoun Road does not form part of any bus route. The main north-south bus movements in the area are served by stops some 400m to the east on the parallel Finchley Road. The nearest stops are stops L and Y some 160m to the north on Belsize Road. Bus stop L is served by routes 31 towards Shepherd's Bush, N28 towards Wandsworth and the N31 towards Clapham Junction. Bus stop Y is served by the same services in the direction of Camden Town.

### *Coach Services*

- 5.5.74 There are no dedicated coach service facilities within Primrose Hill to Kilburn (Camden) area.

### *Public Transport Interchanges*

- 5.5.75 There are no major multi-modal interchanges within Primrose Hill to Kilburn (Camden) area.

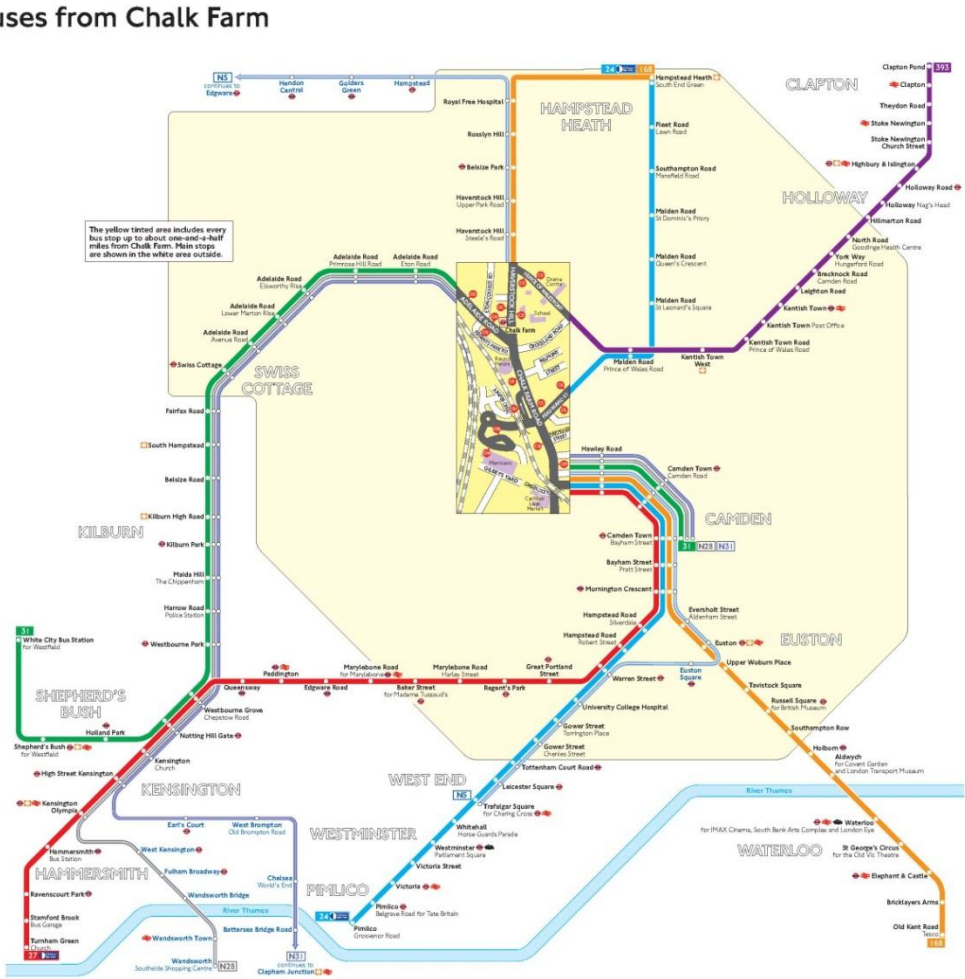
### **Adelaide Road**

- 5.5.76 In the Adelaide Road area, interchange with Chalk Farm Underground station is possible at bus stops CA eastbound and CB westbound at the eastern end of Adelaide Road.

### **Alexandra Place**

- 5.5.77 In the Alexandra Place area, interchange with buses at South Hampstead Overground station is available via bus stop Y eastbound and bus stop L westbound on Belsize Road, approximately 150m to the north and west of South Hampstead Overground station. There are no other public transport interchange facilities in the vicinity.

Figure 5-22 Bus routes that serve Adelaide Road and surrounds



**Route finder**

**Day buses including 24-hour services**

Bus route	Towards	Bus stops
24	Hampstead Heath	Edgware, Clapton
27	Pimlico	Edgware, Clapton
31	Turnham Green	Edgware, Clapton
168	Camden Town	Edgware, Clapton
393	White City	Edgware, Clapton
	Hampstead Heath	Edgware, Clapton
	Old Kent Road	Edgware, Clapton
	Clapton	Edgware, Clapton

**Night buses**

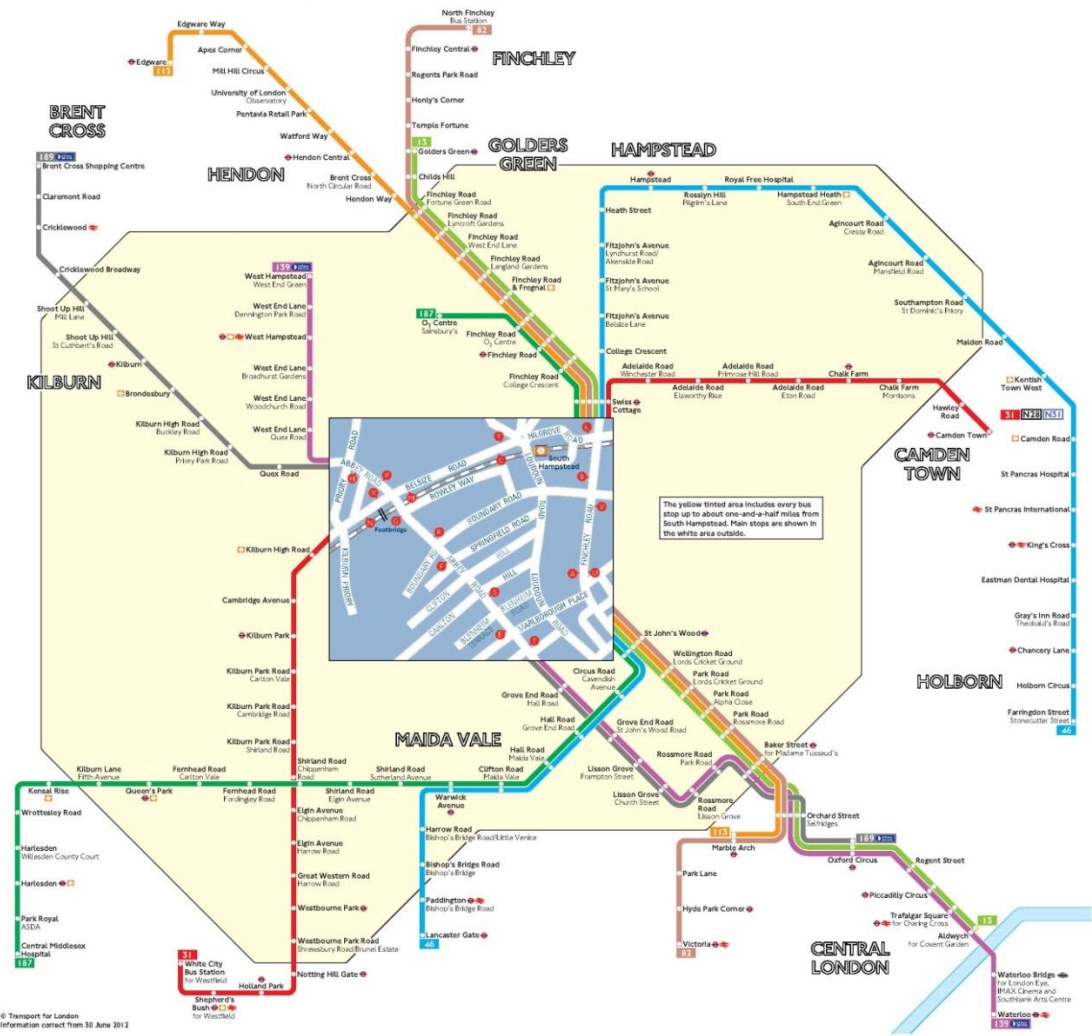
Bus route	Towards	Bus stops
N5	Edgware	Edgware, Clapton
N28	Trafalgar Square	Edgware, Clapton
N31	Camden Town	Edgware, Clapton
	Wandsworth	Edgware, Clapton
	Clapham Junction	Edgware, Clapton

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Information correct from 14 February 2011



Figure 5-23 Bus routes that serve Alexandra Place and surrounds

Buses from South Hampstead



**Key**

- 13 Day buses in black
- N13 Night buses in blue
- Connections with London Underground
- Connections with London Overground
- Connections with National Rail
- Connections with river boats

Red discs show the bus stop you need for your chosen bus service. The disc appears on the top of the bus stop in the street (see map of town centre in centre of diagram).

**Route finder**  
Day buses including 24-hour services

Bus route	Towards	Bus stops
13	Aldwych	13
31	Golders Green	31
46	Camden Town	46
82	Farringham Street	82
113	Lancaster Gate	113
139	North Finchley	139
187	Victoria	187
189	Edgware	189
139	Marble Arch	139
187	Waterloo	187
189	West Hampstead	189
189	Central Middlesex Hospital	189
189	Oxford Circus	189
189	Brent Cross Shopping Centre	189
189	Oxford Circus	189

**Night buses**

Bus route	Towards	Bus stops
N13	Aldwych	N13
N28	North Finchley	N28
N31	Camden Town	N31
N113	Wandsworth	N113
N113	Camden Town	N113
N113	Clapham Junction	N113
N113	Edgware	N113
N113	Trafalgar Square	N113



## **Pedestrians, cyclists and equestrians**

- 5.5.78 The following section describes the pedestrian and cycle facilities in the CFA<sub>3</sub> study area. The cycle network is shown on Figure 5-26. There are no PRoWs in the Primrose Hill to Kilburn (Camden) study area.

### *Pedestrian facilities*

#### **Adelaide Road**

- 5.5.79 Push button pedestrian crossing facilities are located at the Primrose Hill Road/Adelaide Road traffic signalised junction.
- 5.5.80 Uncontrolled pedestrian crossings with central refuge islands are installed approximately 40m to the east and west of the Eton Road junction.

#### **Alexandra Place**

- 5.5.81 Pedestrian access in the vicinity of the roundabout at the junction of Loudoun Road/Belsize Road/Fairfax Road and Fairhazel Gardens is indirect and observations show it does not meet pedestrian desire lines. All crossings are uncontrolled and while pedestrian refuge islands are provided, the ability to make north–south movements over the Belsize Road western arm in the vicinity of the junction is particularly poor.
- 5.5.82 There are zebra crossings located on Hilgrove Road western end at junction with roundabout (on raised table) and Belsize Road on south-western arm of roundabout.
- 5.5.83 A raised junction table is located at the junction of Loudoun Road and Boundary Road and an uncontrolled pedestrian crossing is installed on Loudoun Road 15m north of Alexandra Road.
- 5.5.84 Pedestrian access from Rowley Way to and from Alexandra Place / Loudoun Road is obtained via the Langtry Walk.

### *Non-motorised user flows*

- 5.5.85 Pedestrian movements were captured during the AM peak period at junctions along Adelaide Road and in the Alexandra Place area at the same time that the traffic turning count surveys were undertaken in June 2012.

#### **Adelaide Road**

- 5.5.86 Surveys suggest that southbound pedestrian movement at junctions is higher than the equivalent northbound movements during the AM period. This indicates that the Primrose Hill land use and open space to the south of Adelaide Road are key attractors in the locality.

- 5.5.87 The northern Adelaide Road footway is busier than the southern footway and the eastbound movement is greater than the westbound movement. This suggests that Chalk Farm underground station located at the eastern end of Adelaide Road is a key attractor in the AM period.
- 5.5.88 At the Eton Road junction, approximately 75% of pedestrians were recorded heading eastbound along Adelaide Road compared to 25% travelling westbound. Of the total 177 pedestrian movements during this morning period, approximately 70% were made along the northern footway.
- 5.5.89 Typical weekday morning (08:00-09:00) pedestrian movements surrounding the proposed Adelaide Road works are shown on Figure 5-24.

### **Alexandra Place**

- 5.5.90 At Alexandra Place, surveys suggest that in general, the southbound pedestrian movement at junctions was higher than the equivalent northbound movements during the AM period.
- 5.5.91 At the Belsize Road junction the majority of the movements were in the eastbound direction, indicating that commuters were heading towards Swiss Cottage underground station. A significant but lesser movement was recorded heading towards South Hampstead Overground station.
- 5.5.92 The pedestrian movements recorded along Alexandra Place are relatively low with higher levels on the northern footway and the eastbound movement being the more frequent.
- 5.5.93 Typical weekday morning (08:00–09:00) pedestrian movements surrounding the proposed Alexandra Place vent shaft worksite as shown on Figure 5-25.

Figure 5-24: Adelaide Road – typical weekday AM peak pedestrian movements

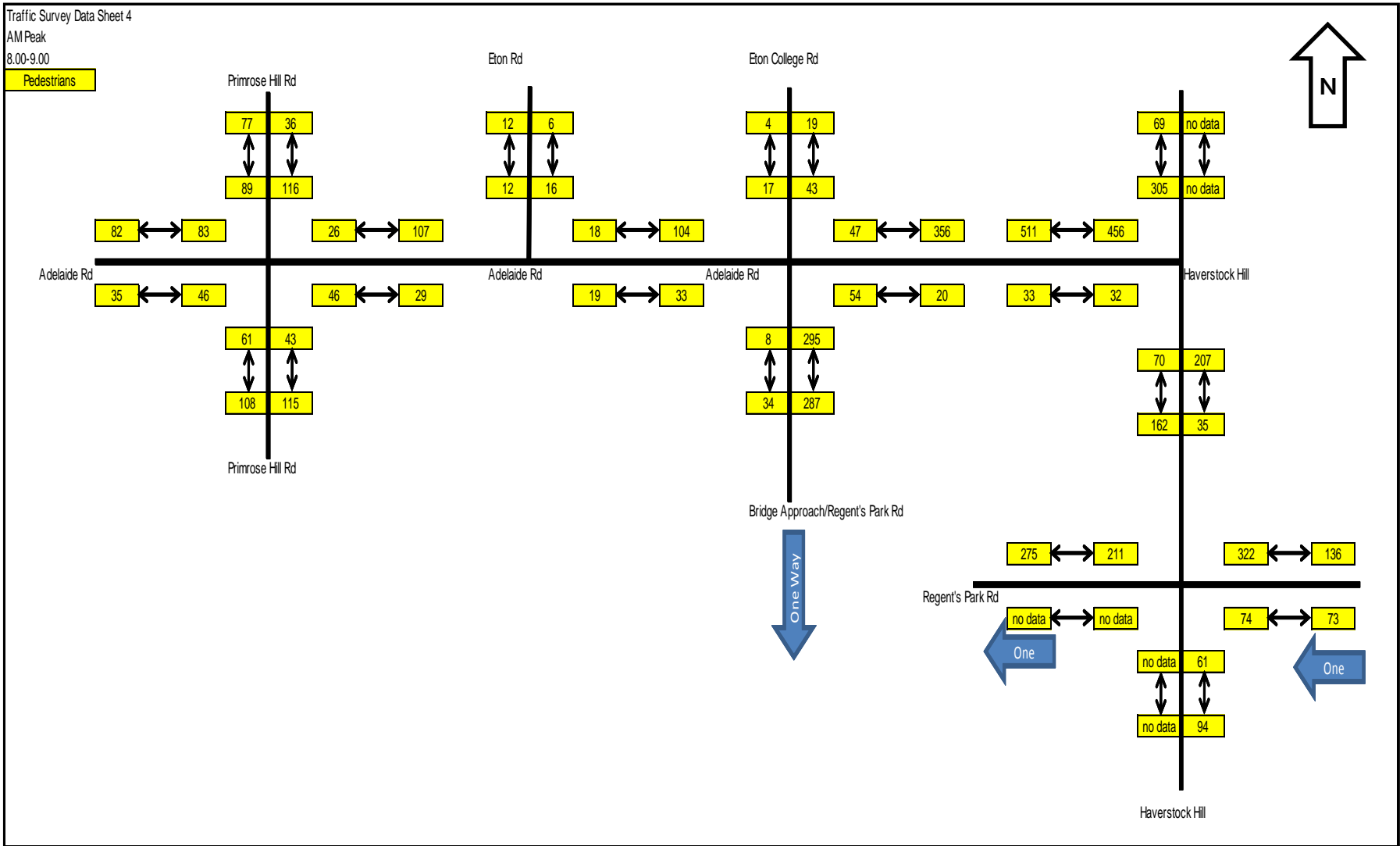
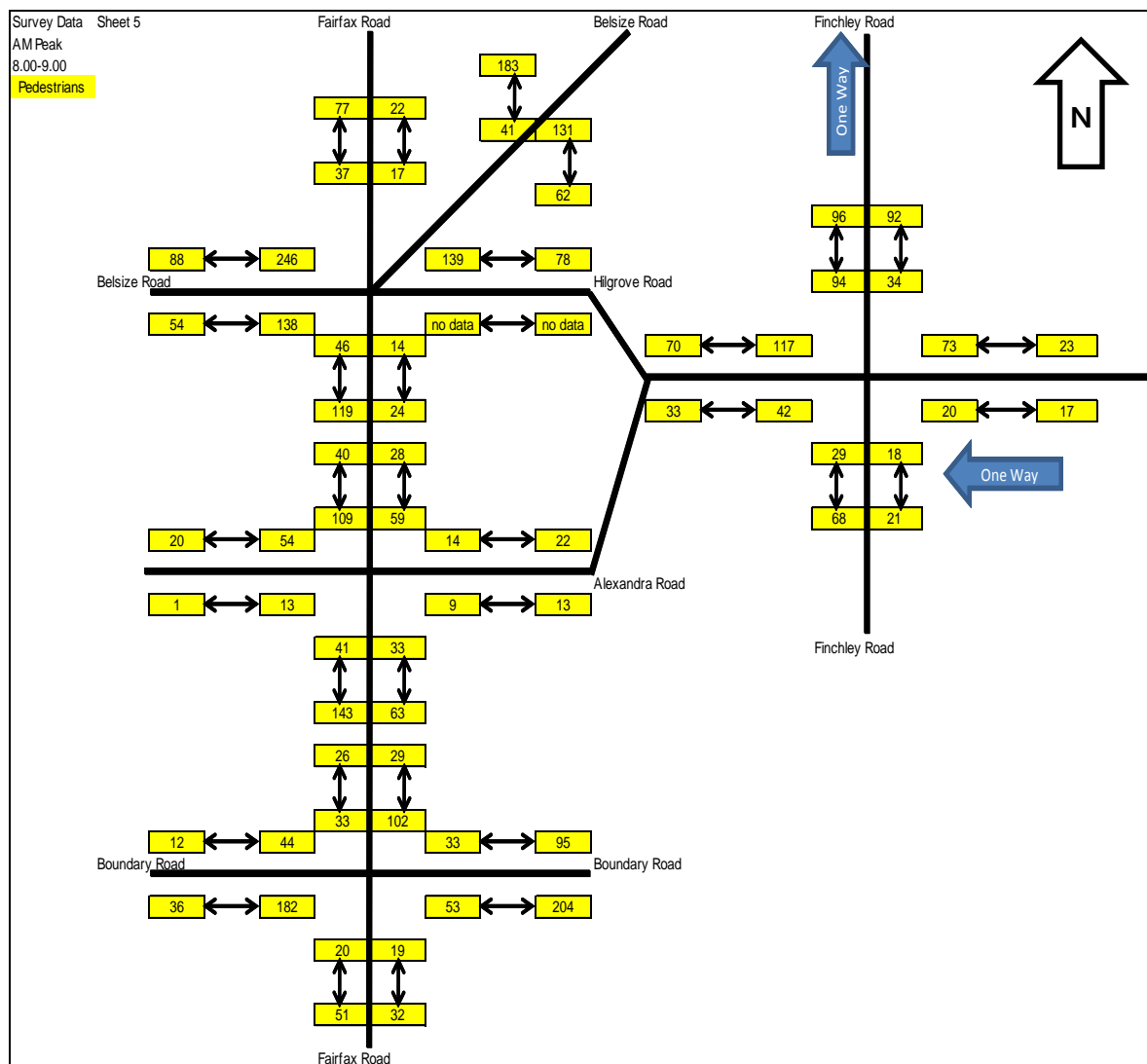


Figure 5-25: Alexandra Place – typical weekday AM peak pedestrian movements



### Cycle facilities

5.5.94 The cycle route within Primrose Hill to Kilburn (Camden) area is shown on Figure 5-26.

### Adelaide Road

5.5.95 Adelaide Road is not recognised by TfL as a route suitable for use by cyclists. However, there are several signed routes and quieter roads suitable for cycling in the area. The sections of Fellows Road and Eton Road to the north of Adelaide Road are routes recommended for use by cyclists. An additional north-south quieter route recommended by cyclists is located on Primrose Hill Road to the west.

5.5.96 ASL are installed on all approaches at the Primrose Hill Road / Adelaide Road junction. Cycle lanes are installed in the following locations:

- Primrose Hill Road / Adelaide Road – short lengths on approach to ASL's on all approaches;

- King Henry's Road / Primrose Hill Road – junction treatment to provide for contra-flow cycling eastbound on King Henry's Road.

### **Alexandra Place**

- 5.5.97 A signed TfL cycle route runs north-south over Loudoun Road bridge and Fairhazel Gardens, connecting with the east-west signed route via Boundary Road. The section of Loudon Road to the south of the site is a quieter route recommended for cyclists.
- 5.5.98 On-street cycle stands are installed in the following locations:
- Fairfax Road western side near roundabout – two stands;
  - Fairhazel Gardens western side near junction with roundabout – one stand.

### *Equestrian facilities*

- 5.5.99 There are no dedicated equestrian facilities in the vicinity of the Proposed Scheme in Central Camden.

### **Waterways/canals**

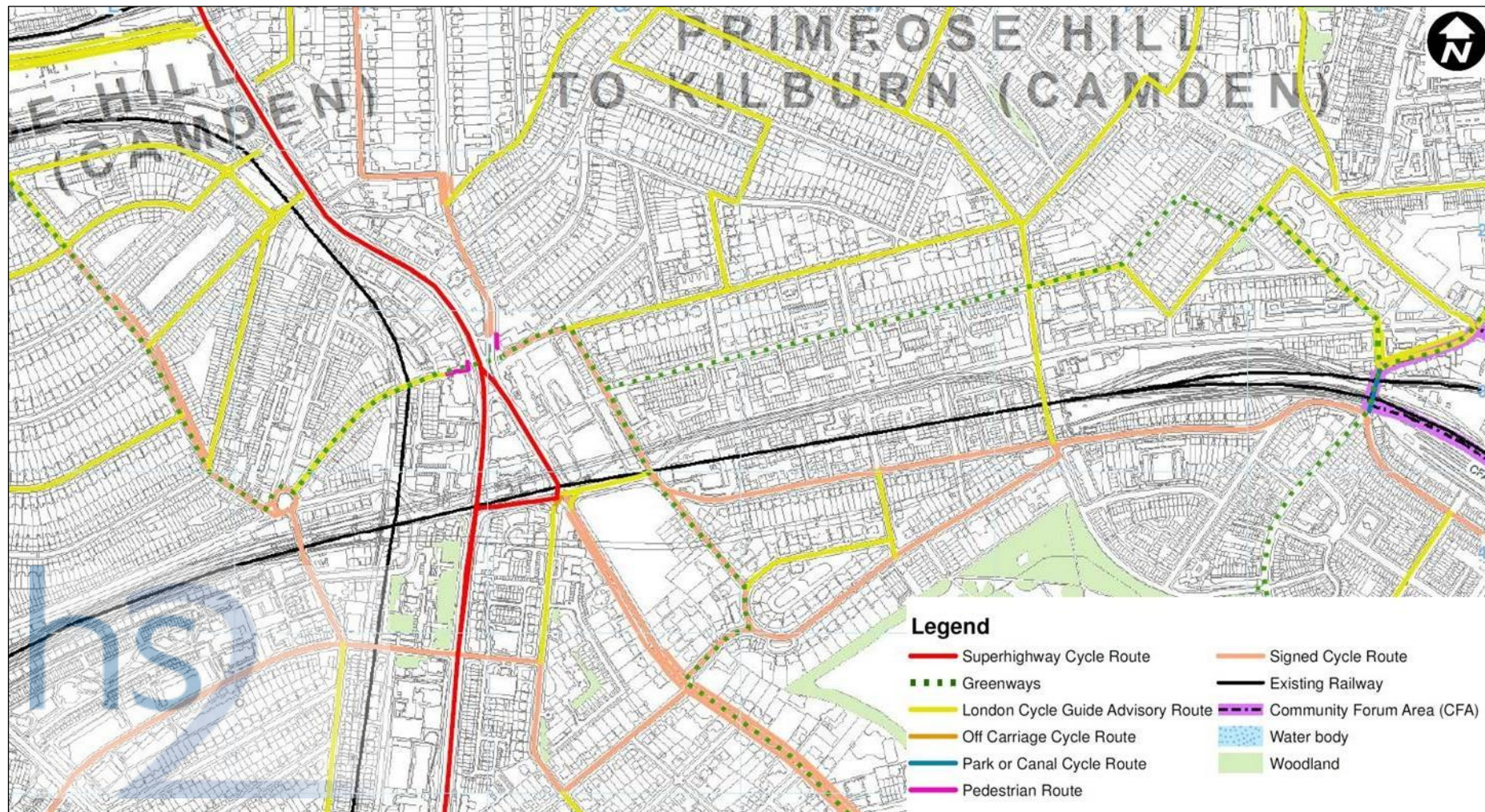
- 5.5.100 There are no waterways or canals in the immediate vicinity of works within the Primrose Hill to Kilburn CFA.

### **Air transport**

- 5.5.101 There are no airports in the vicinity of the Proposed Scheme within the Primrose Hill to Kilburn area.



Figure 5-26: Cycle routes within Primrose Hill to Kilburn (Camden) study area



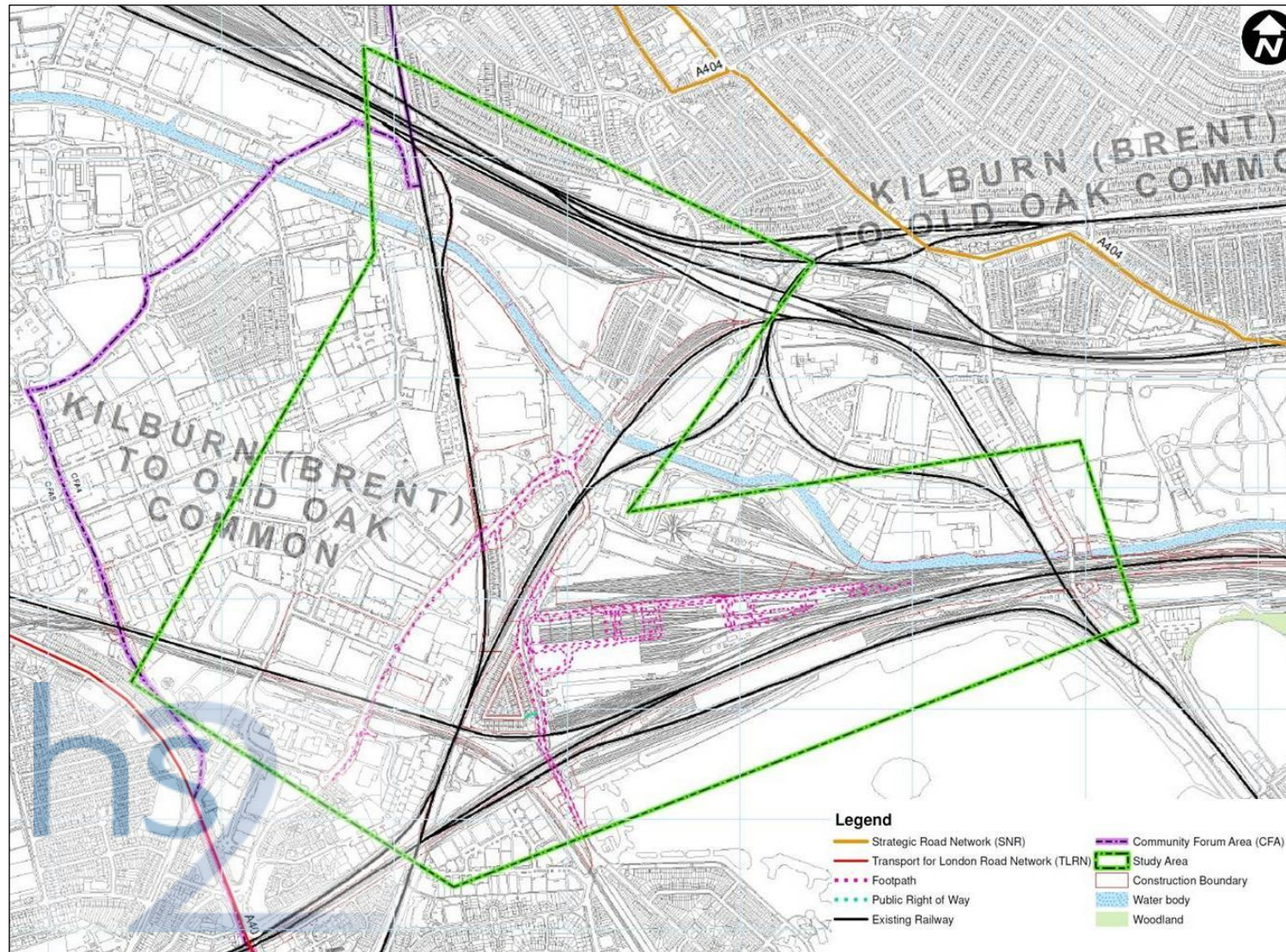
## 5.6 Kilburn (Brent) to Old Oak Common (CFA<sub>4</sub>)

### Study area

- 5.6.1 This section provides an overview of the baseline traffic and transport conditions for the section of the Proposed Scheme that passes through the Kilburn (Brent) to Old Oak Common CFA.
- 5.6.2 It describes the transport infrastructure within the CFA, which would be affected either by the construction or operation of the Proposed Scheme. For this area, the baseline conditions relate to the transport network affected by construction of the proposed vent shaft headhouse at Salusbury Road and proposed Interchange Station at Old Oak Common along with the operational impacts of the Proposed Scheme.
- 5.6.3 The scope of work and study area has been discussed with the key transport authorities including TfL, the London Borough of Brent (LBB), the Royal Borough of Kensington and Chelsea (RBKC), the City of Westminster (CoW), the London Borough of Hammersmith and Fulham (LBHF) and the London Borough of Ealing (LBE). The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFA<sub>4</sub> Report), the core study area within the CFA boundary and the main road network can be seen in Figure 5-27.
- 5.6.4 For ease of reference, the baseline transport conditions for each mode are generally described from east to west.



Figure 5-27: Kilburn (Brent) to Old Oak Common study area



## Local land uses

- 5.6.5 The proposed route alignment through the Kilburn to Old Oak Common area passes through a range of inner city urban land uses including residential, office, retail, light industrial, warehousing and generic business trades.

### *Salusbury Road*

- 5.6.6 The borough boundary of Brent and City of Westminster runs east-west along the centre of Kilburn Road. The works are on the southern side of the existing railway lines and Queen's Park Station. Currently the land is occupied by a disused printing factory and a public pay and display car park.
- 5.6.7 The area to the north of Queen's Park station is of predominately residential use (C3 and C4) with retail (A1) and restaurant (A3) use fronting Salusbury Road. To the south of the station the land use is a mixture of residential, commercial and some light industrial.

### *Old Oak Common area*

- 5.6.8 Old Oak Common is located in the London Borough of Hammersmith & Fulham on the boundary with the London Borough of Ealing which runs along the back of the eastern Old Oak Common Lane footway.
- 5.6.9 Current local land uses within the vicinity of the proposed works include the 500 hectare Park Royal Industrial Estate, which is the largest in London. The area hosts more than 40,000 jobs and the draft Opportunity Area Planning Framework (OAPF) indicates that more than 70% of trips are made by car.
- 5.6.10 Old Oak Common railway depot is located on the eastern side of Old Oak Common Lane. Old Oak Common Lane also provides access to the railway sidings and maintenance depot. The surrounding area is predominantly of Industrial Use (B1 and B2).
- 5.6.11 The small enclosed residential area of Wells House Road is located immediately west of the railway depot on Old Oak Common Lane. Wormwood Scrubs lies to the south, beyond which is a larger residential area. The existing depot level is several metres below Old Oak Common Lane.

### *Willesden Euroterminal*

- 5.6.12 The Willesden Euroterminal lies within the LB Ealing. It used to operate as a freight depot but since 2006 it is been largely redundant. The land use to the north of the site is largely residential (C3). To the south it is predominately industrial (B2). Willesden Junction station is located to the east and Harlesden station lies to the west.

## Surveys

- 5.6.13 Traffic, non-motorised user and station surveys were undertaken in the three-weeks between 18 June-6 July 2012 during a period which avoided the effect of the Hammersmith Flyover emergency closure, National holidays (including the Queen's Jubilee and Royal Wedding) and also the Olympics & Paralympics period. Non-motorised user and station surveys were undertaken in September 2012.
- 5.6.14 Utilities diversion works at the Salusbury Road/Kilburn Lane junction over an extended period have precluded full surveys. Spot counts and site observations have therefore been undertaken to help understand the baseline situation. The survey locations are shown within the Baseline Survey Report in Annex B(ii).

### *Traffic surveys*

- 5.6.15 The traffic surveys comprised:
- MCC at highway junctions were undertaken on a weekday between 07:00 – 10:00, 11:00 – 14:00 and 16:00 – 19:00 and on a Saturday between 10:00 and 14:00;
  - traffic signal staging; green time, inter-green and cycle time data was obtained from TfL. Saturation flow surveys at signal controlled junctions were undertaken for the same time periods as the MCCs;
  - ATC on highway links across the study area. Wherever possible ATC data was gathered for a continuous two week period to coincide with the date of the MCCs;
  - journey time surveys on key routes and sections of the highway network. Journey times were recorded on weekdays and for 08:00 – 09:00, 11:00 – 12:00 and 17:00 – 18:00 and at weekends from 11:00 – 12:00; and
  - parking accumulation within the vicinity of the planned worksites was recorded from 05:00 – 22:30 at 30-minute intervals on a weekday and at the weekend.

### *Non-motorised user surveys*

- 5.6.16 Pedestrian flow surveys at junctions were undertaken in parallel with MCC surveys. Non-motorised user surveys were undertaken to establish movements in the area of the Proposed Scheme.

### *Station survey*

- 5.6.17 Pedestrian surveys were carried out at Queen's Park station during a weekday morning peak period of 08:00 – 09:00. The results of this information are presented within the Baseline Traffic Survey Report in Annex B(ii).



## Highway network

- 5.6.18 The following section describes the roads that would be affected by the Proposed Scheme, either at the construction stage or when operational. The study area includes the Salusbury Road area in Kilburn/Queen's Park and the Old Oak Common area as far west as the B4492 Park Royal Road. The area encompasses the east-west running A40 which forms part of the TLRN.

### *Strategic road network*

- 5.6.19 There are no motorways within the study area.

### **'A' roads**

- 5.6.20 The 'A' road network in London comprises both the TLRN and the SRN.

#### *Salusbury Road*

- 5.6.21 Salusbury Road lies approximately 960m west of the A5 Kilburn High Road and 1.3km east of the A404 Harrow Road. The A40 is approximately 1.3km to the south and the A41 about 2.3km to the east.

- 5.6.22 Kilburn Lane runs from west to east connecting A404 Harrow Road with A5 Maida Vale via B423 Kilburn Lane/Carlton Vale. Salusbury Road runs north from the gyratory with Kilburn Lane and connects with the east-west running A407 at Willesden.

#### *Park Royal area (Old Oak Common, Victoria Road, Atlas Road and Willesden Euroterminal)*

- 5.6.23 The Old Oak Common works are located just over a kilometre north of the east-west running A40. The A40 is the principal strategic access corridor in the area and is part of the TLRN. It commences from Paddington in Central London and runs for over 22km until it connects with the M40 and M25 in the west. The A406 TLRN is also in relatively close proximity, lying 3km to the west and the A3220 is located 2.4km to the south east. The A312 TLRN connecting the A20 with the M4 is approximately 9km to the west of the site.

- 5.6.24 The A4000 Victoria Road connects the central Park Royal industrial areas and communities to the north such as Harlesden and Willesden to the A40 Western Avenue. East of the junction with Old Oak Common Lane, the A40 is designated as 'The Westway'. West of the junction, it is designated as 'Western Avenue'.

### *Local road network*

#### **Salusbury Road**

- 5.6.25 The works are located adjacent to Kilburn Lane and Salusbury Road. Salusbury Road and Kilburn Lane are predominantly single-carriageway, two-way roads. The works are bounded by Kilburn Lane (north-south gyratory) to the south east, Claremont Road (residential street) to the west and railway cutting (LU and Overground lines) to the north.

#### **Park Royal area (Old Oak Common, Victoria Road, Atlas Road and Willesden Euroterminal)**

- 5.6.26 Old Oak Common Lane runs for approximately 1.8km from north to south. It is a local distributor road connecting residential communities south of the Great Western Mainline with the A40 Westway to the south and A4000 Victoria Road to the north. It also provides access to the Old Oak Common railway sidings and maintenance depot. Wells House Road can only be accessed from Old Oak Common Lane.
- 5.6.27 There are three discrete over-bridge structures on Old Oak Common Lane to the south of the planned site. Each is subject to a maximum height restriction of 3.8m and double deck buses are thus prohibited to travel between the northern and southern sections of Old Oak Common Lane.
- 5.6.28 At its northern end, Old Oak Common Lane links with Victoria Road for connections to the north, east and west via Harlesden. At its southern end, it connects with the A40.
- 5.6.29 A small spur of Old Oak Common Lane lies to the south of the A40 junction and forms part of a small triangular gyratory together with Old Oak Road Lane and East Acton Lane.
- 5.6.30 Right turning traffic southbound on Old Oak Common Lane to Western Avenue westbound is prohibited. This movement is catered for by utilising the gyratory described above to approach The Westway in a northbound direction on the East Acton gyratory south of Old Oak Common Lane.
- 5.6.31 Victoria Road connecting between Old Oak Common Lane and the A40 provides an alternative higher capacity route, but experiences congestion at the Old Oak Common Lane and A40 junctions.
- 5.6.32 The area has limited connectivity with the wider highway network due to the severance effect of multiple railway lines and the Grand Union Canal combined with the presence of many one-way/no entry restrictions to streets adjoining Western Avenue.

- 5.6.33 Chase Road is a local distributor road running in a north-south direction from the North Acton Gyratory part of the A4000 Victoria Road and connecting with the B4492 Acton Lane. The bridge over the Central Line and Parliamentary railway located to the southern end of Chase Road is subject to an 18t mgw (maximum gross weight) restriction.

### *Baseline conditions*

- 5.6.34 This section examines baseline traffic flows on the strategic and local highway network.

Table 5-58: Kilburn (Brent) to Old Oak Common 2012 baseline flows

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
Kilburn High Road (south of Belsize Road)	NB	657	79	553	54
	SB	202	47	316	46
Salisbury Road (north of Premier Corner)	NB	462	10	506	5
	SB	413	9	368	10
Premier Corner (north of Kilburn Lane)	NB	966	55	887	34
Chamberlayne Road (north of Kilburn Lane)	NB	327	58	534	65
	SB	376	73	485	50
Harrow Road (west of College Road)	WB	568	30	624	35
	EB	382	44	542	23
Scrubs Lane (north of Hythe Road)	NB	489	34	973	51
	SB	783	65	507	31
Old Oak Common Lane (north of Wulfstan Street)	NB	262	31	340	32
	SB	380	28	225	16
Old Oak Common Lane (south of Du Cane Road)	NB	653	37	329	26
	SB	339	33	434	25
Wales Farm Road	SB	1,170	146	1,136	57
Victoria Road (north of Park Royal Road)	NB	1,042	130	890	50
Park Royal Road	NB	375	35	325	39
	SB	328	64	412	25

- 5.6.35 The operation of the key junctions which form the main access routes from the strategic network to the study area sites have been analysed for the 2012 existing conditions and the results are summarised below.



### Salusbury Road/Carlton Vale/Fernhead Road/Kilburn Lane

- 5.6.36 This is a four-arm non-signalised triangular intersection with no pedestrian provisions. Salusbury Road and Kilburn Lane are one-way roads running north-south and east-west direction respectively. Salusbury Road has four lanes, two of which connect straight ahead with Carlton Vale and the other lanes split allowing traffic onto Kilburn Lane and Fernhead Road. Carlton Vale is a double-lane two-way road. Traffic approaching the junction on Fernhead Road is only permitted to turn left onto Kilburn Lane. Bus stops are located in close proximity to the junction on Carlton Vale and Fernhead Road. Bus routes 36, 316, 6 and 187 make use of the junction. To the north, the junction is close to Queen's Park station.
- 5.6.37 Table 5-59 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated WeLHAM model.

Table 5-59: 2012 baseline performance at junction Salusbury Road/Carlton Vale/Fernhead Road / Kilburn Lane (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Salusbury Road	993	18	0
Carlton Vale	362	9	0
Fernhead Road	293	35	0
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Salusbury Road	766	14	0
Carlton Vale	470	12	0
Fernhead Road	348	45	0

- 5.6.38 The model shows that this junction operates well within capacity in AM and PM peak hours with no queues. Salusbury Road carries almost double the traffic as other arms of the junction.

### Premier Corner/Kilburn Lane

- 5.6.39 This junction is a small three-arm non-signalised intersection with a pedestrian refuge island at its centre. The three-arm zebra crossings provide the means for pedestrian crossing. Eastbound traffic approaching the junction on Kilburn Lane is only permitted to turn left into Premier Corner which is a one-way road. The westbound traffic on Kilburn Lane is split into two. One lane permits traffic to turn right into Premier Corner and the other lane allows traffic to continue to go straight ahead on Kilburn Lane.
- 5.6.40 Bus stops are located on Premier Corner and Kilburn Lane in close proximity to this junction. Bus routes 36, 316, 6 and 187 run through the junction mostly to and from the western arm of Kilburn Lane. There are some parking bays along western arm of Kilburn Lane.

- 5.6.41 Table 5-60 below shows existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated WeLHAM model.

Table 5-60: 2012 baseline performance at junction Premier Corner/Kilburn Lane

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Kilburn Lane (WB)	759	13	0
Kilburn Lane (EB)	379	39	0
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Kilburn Lane (WB)	922	16	0
Kilburn Lane (EB)	276	30	0

- 5.6.42 The model shows that this junction performs within its capacity in AM and PM peak hours with no queuing developing at the junction. Kilburn Lane is the primary road and carries approximately double the traffic than other arms of the junction.

### Salisbury Road/Brondesbury Road/Harvist Road

- 5.6.43 This junction is a four-arm signalised intersection with controlled pedestrian crossing facilities on all arms. Salisbury Road runs through the junction in the north-south direction. Brondesbury is the east arm and Harvist Road being the west arm. All arms are single lane two-way roads with ASLs. Queen's Park station is located to the south of the junction on Salisbury Road. Bus route 206 travels through the junction using the northern arm of Salisbury Road and Brondesbury Road.
- 5.6.44 Table 5-61 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated WeLHAM model.

Table 5-61: 2012 baseline performance at junction Salusbury Road/Brondesbury Road/Harvist Road (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Salusbury Road (SB)	367	60	7
Brondesbury Road	126	15	2
Salusbury Road (NB)	472	56	9
Harvist Road	199	30	4
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Salusbury Road (SB)	344	45	5
Brondesbury Road	111	17	2
Salusbury Road (NB)	511	40	8
Harvist Road	173	32	3

- 5.6.45 The model shows that this junction operates comfortably within capacity in AM and PM peak hours. Minor queuing develops at the junction particularly for southbound traffic on Salusbury Road.

#### **A40 Western Avenue/Old Oak Common Lane/Old Oak Road**

- 5.6.46 This junction is a large five-arm signalised intersection with controlled pedestrian crossing facilities on all arms. The A40 Western Avenue is on the TLRN is a strategic road. It has five entry and three exit lanes on its western arm and four entry and three exit lanes on the eastern arm. Old Oak Road and the southern arm of Old Oak Common Lane are one-way roads with outbound and inbound traffic flows respectively. Old Oak Road has two exit lanes and Old Oak Common Lane south has four entry lanes. Three entry and two exit lanes are provided by the northern arm of Old Oak Common Lane. No parking spaces/bays are provided in the vicinity. Bus stops exist on all the approach arms with bus routes 228, 260, 272, 70 and 95 running through the junction.
- 5.6.47 Table 5-62 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated WeLHAM model.

Table 5-62: 2012 baseline performance at junction A40 Western Avenue/Old Oak Common Lane/Old Oak Road (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Old Oak Common Lane (SB)	372	76	8
A40 Westway	2116	73	35
Old Oak Common Lane (NB)	1550	63	18
A40 Western Avenue (EB)	3403	102	43
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Old Oak Common Lane (SB)	458	93	10
A40 West Way	2366	93	42
Old Oak Common Lane (NB)	1513	61	16
A40 Western Avenue (EB)	3029	88	39

- 5.6.48 The model shows that this junction operates over its capacity in AM and PM peak hours. The A40 Western Avenue carries the largest traffic volume passing through the junction during both peak hours. High traffic volumes on this road contribute to significant congestion, which adversely impacts upon the performance of the junction. Old Oak Common Lane (NB) also experiences a substantial traffic movement with queuing build up.

### Old Oak Common Lane/Du Cane Road

- 5.6.49 This junction is a three-arm signalised intersection with controlled pedestrian crossing facilities and ASLs provided on each arm. All the arms are two-way roads with two lanes running in each direction on Old Common Lane and a single lane carriageway in Du Cane Road. Bus routes 7, 70, 72, 272 and 283 use the junction serving Old Oak Common Lane and Du Cane Road.
- 5.6.50 Table 5-63 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated WeLHAM model.

Table 5-63: 2012 baseline performance at junction Old Oak Common Lane / Du Cane Road (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Old Oak Common Lane (SB)	178	92	4
Du Cane Road	158	31	3
Old Oak Common Lane (NB)	690	64	9
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Old Oak Common Lane (SB)	340	76	4
Du Cane Road	190	62	4
Old Oak Common Lane (NB)	355	34	4

- 5.6.51 The model shows that this junction performs very close to its capacity in the AM peak hour and within capacity in the PM peak hour. The southern arm of Old Oak Common Lane carried a higher volume of traffic during AM Peak hour. This contributes to the generation of queuing on this road and may present some issues should the traffic flow increase due to the short length of this link. A lower level of queuing is present on other arms.

#### **A4000 Victoria Road/Atlas Road/Old Oak Lane/Old Oak Common Lane**

- 5.6.52 This junction is a four-arm signalised intersection with controlled pedestrian crossings on all arms. Victoria Road approaches the junction from the south west, Old Oak Common Lane from the south east, Atlas Road from the north-west and Old Oak Lane from the north east. All approaches to the junction have two-lanes, with an ASL on Old Oak Common Lane. The exit lanes are single lanes. Old Oak Common Lane approach crosses over the railway lines. A north bound cycle lane exists on Old Oak Lane. Bus stops are located in close proximity to the junction on Old Oak Lane. Bus routes 228 and 266 operate through the junction. The 228 serves Old Oak Lane and Old Oak Common Lane and the 226 travels along Old Oak Lane and A4000 Victoria Road.
- 5.6.53 Table 5-64 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated WeLHAM model.

Table 5-64: 2012 baseline performance at junction A4000 Victoria Road /Atlas Road/Old Oak Lane/Old Oak Common Lane (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Atlas Road	50	23	1
Old Oak Lane	707	43	8
Old Oak Common Lane	308	66	5
Victoria Road	445	29	5
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Atlas Road	159	73	3
Old Oak Lane	599	37	7
Old Oak Common Lane	380	84	7
Victoria Road	443	28	5

- 5.6.54 The model shows that this junction performs within capacity in AM Peak hour and close to its capacity in PM peak hour. Old Oak Lane is exposed to the highest traffic flow at Peak hours resulting in higher queue levels.

### Bethune Road/Victoria Road

- 5.6.55 This junction is a minor three-arm non-signalised intersection. The fourth east arm is an access to the industrial site adjacent to the junction. Bethune Road, which adjoins Victoria road from the west, is a one-way two lane road carrying the incoming flow. There are bus stops on both arms of Victoria Road adjacent to the junction. Bus route 266 travels along Victoria Road.
- 5.6.56 Table 5-65 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated WeLHAM model.

Table 5-65: 2012 baseline performance at junction Bethune Road/Victoria Road

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Bethune Road	26	8	0
Victoria Road (SB)	478	36	3
Victoria Road (NB)	350	32	2
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Bethune Road	26	8	0
Victoria Road (SB)	487	38	3
Victoria Road (NB)	272	26	2

- 5.6.57 The model shows that this junction performs well within capacity in AM and PM peak hours. Almost no queue is observed at the junction. Victoria Road experiences relatively much greater traffic volume.

### A40 Western Avenue/Wales Farm Road/Leamington Park

- 5.6.58 This junction is a four-arm signalised intersection with controlled pedestrian crossing facilities on all the arms except for the northern arm of Western Avenue. Wales Farm Road and Leamington Park are one way roads. Wales Farm Road is a wide five-lane carriageway with two lanes permitting traffic to turn right onto the A40 Western Avenue, one lane left onto the A40 Western Avenue and the remaining two straight across into Leamington Park. A40 Western Avenue is part of the TLRN. Both arms of A40 Western Avenue have three entry and three exit lanes. There is also an additional lane for the left turning traffic on the approach side of southern arm of Western Avenue. No parking spaces are present around the junction. Bus stops are located on Leamington Park and on the approach side of north Western Avenue. Bus route 95 travels along Western Avenue using the junction.
- 5.6.59 Table 5-66 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated WeLHAM model.



Table 5-66: 2012 baseline performance at junction A40 Western Avenue/Wales Farm Road/Leamington Park (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Western Avenue (EB)	3230	98	36
Wales Farm Road	1316	46	24
Western Avenue (WB)	2586	66	31
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Western Avenue (EB)	2784	75	26
Wales Farm Road	1193	49	27
Western Avenue (WB)	2999	68	35

- 5.6.60 The model shows that this junction operates beyond its capacity in the AM peak hour and within capacity in the PM Peak hour. Western Avenue has the largest traffic volume passing through the junction during both peak hours. High traffic volumes on this road translate into significant congestion, which adversely impacts upon the performance of the junction. In contrast, although Wales Farm Road experiences high level of congestion, it does not affect the performance of the junction.

#### **A404 Harrow Road/Scrubs Lane**

- 5.6.61 This is a three-arm signalised intersection with controlled pedestrian crossing facilities on the western arm of Harrow Road and Scrubs Lane.
- 5.6.62 The A404 is the primary road at this junction which runs west to east in two lanes in each direction. The eastbound traffic on the western arm of Harrow Road can either go straight or turn right into Scrubs Lane. The westbound traffic is split by a traffic island permitting traffic to turn left into Scrubs Lane or continue straight on A404 Harrow Road. The Scrubs Lane approach is a three lane carriageway permitting traffic to turn either left or right on to the A404 Harrow Road. All approach arms have got ASLs and a cycle lane running southbound on Scrubs Lane.
- 5.6.63 Two bus services pass through the junction. The 220 serves Scrubs Lane and the western arm of A404 Harrow Road. The route 18 runs west to east across the junction on A404 Harrow Road.
- 5.6.64 Table 5-67 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated WeLHAM model.

Table 5-67: 2012 baseline performance at junction Harrow Road/Scrubs Lane (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Harrow Road (EB)	750	67	11
Harrow Road (WB)	745	89	11
Scrubs Lane	497	32	9
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Harrow Road (EB)	601	70	10
Harrow Road (WB)	631	78	9
Scrubs Lane	1023	50	16
Leamington Park	N/A	N/A	N/A

- 5.6.65 The model shows that this junction performs almost near capacity in AM and PM peak hours. The traffic load on all arms is heavy during both peak hours resulting in long queues. The congestion is particularly significant on Scrubs Lane in the PM peak hour.

### Accidents and safety

- 5.6.66 Accident data covering a 36-month period to the end of March 2012 was obtained from TfL and the analysed information is presented below.

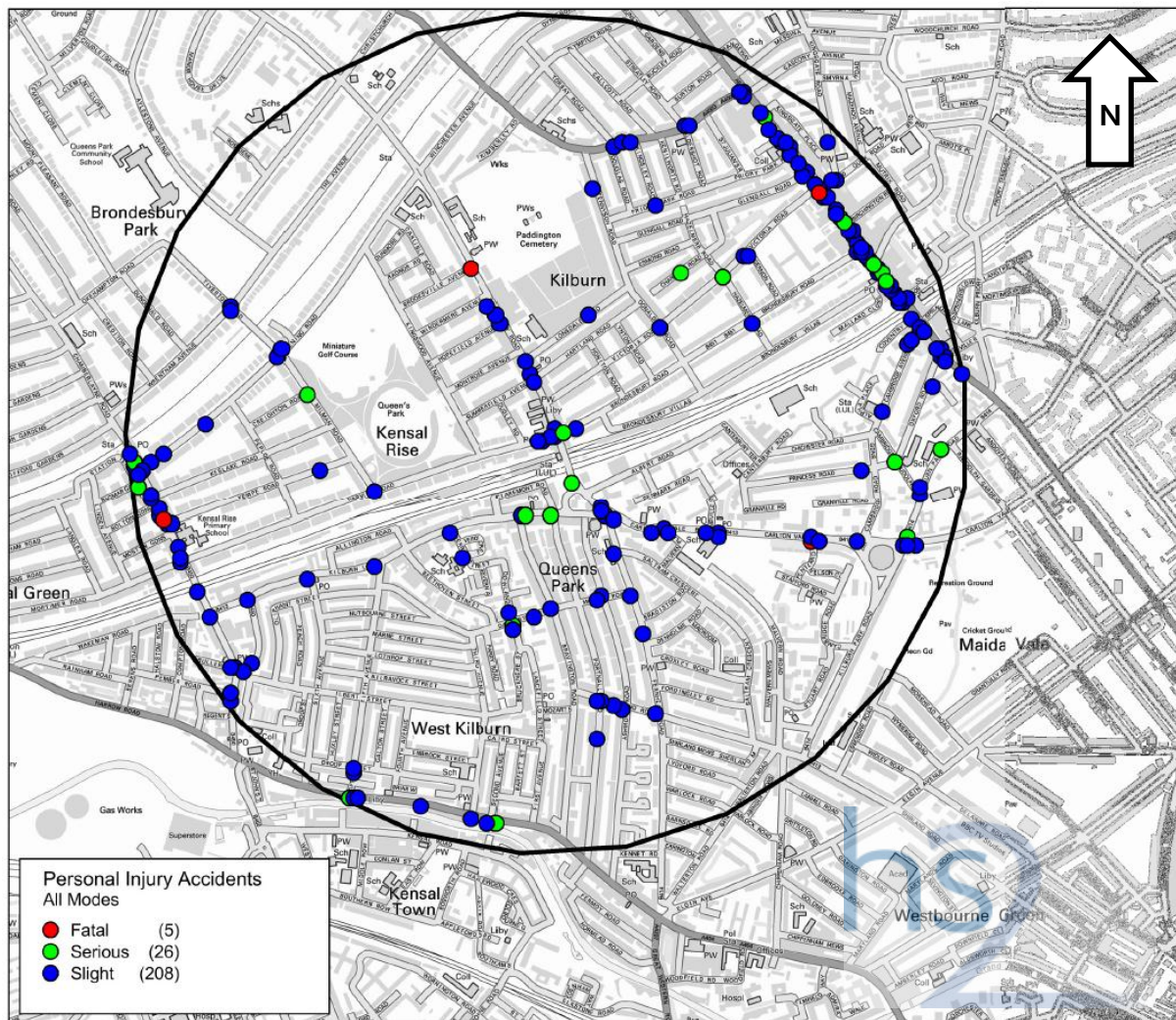
### Salusbury Road

- 5.6.67 A total of 239 PIA occurred over the three year period in the Salusbury Road study area, an average of 80 per year. The locations of the accidents are shown on Figure 5-28.
- 5.6.68 Of the 239 accidents, 87% were classified as slight, 11% involved a serious injury and 2% were fatal accidents. The highest number of accidents occurred along the A5 Kilburn High Road between Willesden Road and Belsize Road; Salusbury Road; Kilburn Lane; Carlton Vale; and Chamberlayne Road; with clusters along Marban Road; Dart Street; Shirland Road; and A404 Harrow Road.
- 5.6.69 Table 5-68 shows that within the Salusbury Road core study area the level of fatal and serious accidents is marginally higher than elsewhere in Brent and the same as the rest of Greater London.

Table 5-68: Accident records (Salusbury Road)

Area	Fatal	Serious	Slight	Total Accidents
CFA <sub>4</sub> - Salusbury Road	5	10.8	26	208
Mean PIA per annum	1.7	3.6	8.7	69.3

Figure 5-28: Salusbury Road area, all accidents (number, location and severity)

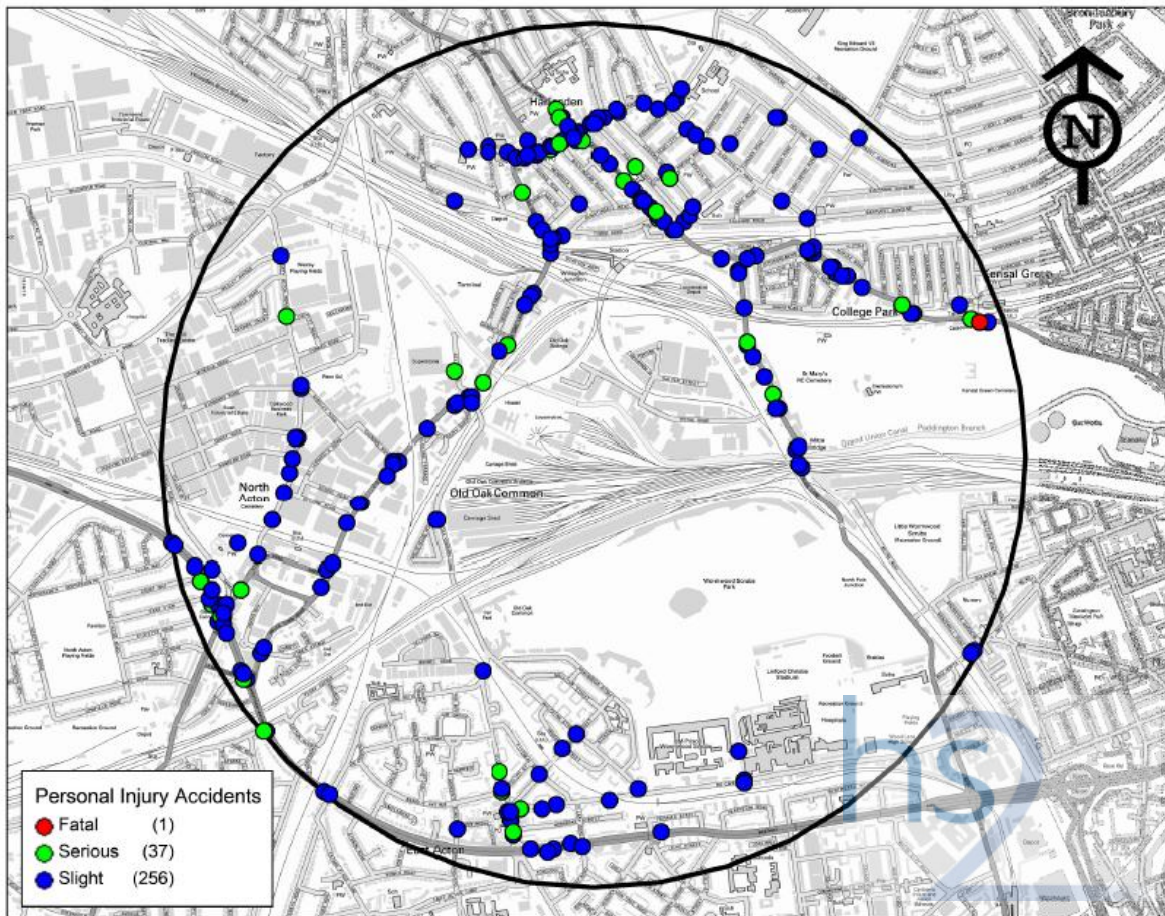


### Park Royal area (Old Oak Common, Victoria Road, Atlas Road and Willesden Euroterminal)

- 5.6.70 A total of 294 PIA occurred over the three year period in the Salusbury Road study area, an average of 98 per year. The locations of the accidents are shown on Figure 5-29 below.
- 5.6.71 Of the 294 accidents, 87% were classified as slight and 13% involved a serious injury, with no fatal accidents. The highest number of accidents occurred concentrated to the north of the site around the A404 Station Road/High Street, the A41 junction with Horn Lane to the south west and in and around the residential area to the south of Old Oak Common Lane.



Figure 5-29: Old Oak Common, all accidents (number, location and severity)



5.6.72 Table 5-69 shows that within the Old Oak Common core study area the level of fatal and serious accident is higher than elsewhere in Ealing and about the same as the rest of London.

Table 5-69: Accident records (Old Oak Common)

Area	Fatal	Serious	Slight	Total Accidents
CFA <sub>4</sub> - Old Oak Common	1	37	256	294
Mean PIA per annum	0.3	12.3	85.3	98

### Parking and loading

5.6.73 This section describes the parking controls in the vicinity of the Proposed Scheme and presents the results of the parking accumulation surveys undertaken in 2012.

5.6.74 The general pattern of weekend demand was recorded as much less than shown in the weekday survey.

### *Parking controls*

#### **Salisbury Road**

- 5.6.75 There is an existing public pay and display car park on the site. It operates Monday to Saturday between 08:00 and 18:30 and is operated by L.B. Brent. Outside these hours the car park is free. Single yellow line waiting and loading restrictions are in place on the majority of roads in the area. The restrictions are 'No waiting and no loading' Monday – Friday between 08:00 and 18:30. The restriction on Salisbury Road between the gyratory and Harvist Road is 'no waiting and loading at any time' (double yellow lines).
- 5.6.76 The site and the immediately surrounding public highway lie within L.B. Brent CPZ KC. The restrictions operate from Monday – Friday 08:30 to 18:30. A number of resident permit holders, pay & display, disabled and motorcycle bays are located on these streets. Parking restrictions in these streets do not apply at weekends. Outside of designated bays and 'no waiting at any time' double yellow line restrictions, waiting is generally prohibited between 08:30-16:30 Monday – Friday (with some sections subject to 'no waiting' Monday – Saturday 08:00 to 14:30 and 'no loading' Monday – Saturday 08:00- 09:30 and 16:30- 18:30). The area south of Kilburn Road lies within City of Westminster CPZ C2, whose operational hours are Monday – Friday 08:30- 18:30.

#### **Park Royal area (Old Oak Common, Victoria Road, Atlas Road and Willesden Euroterminal)**

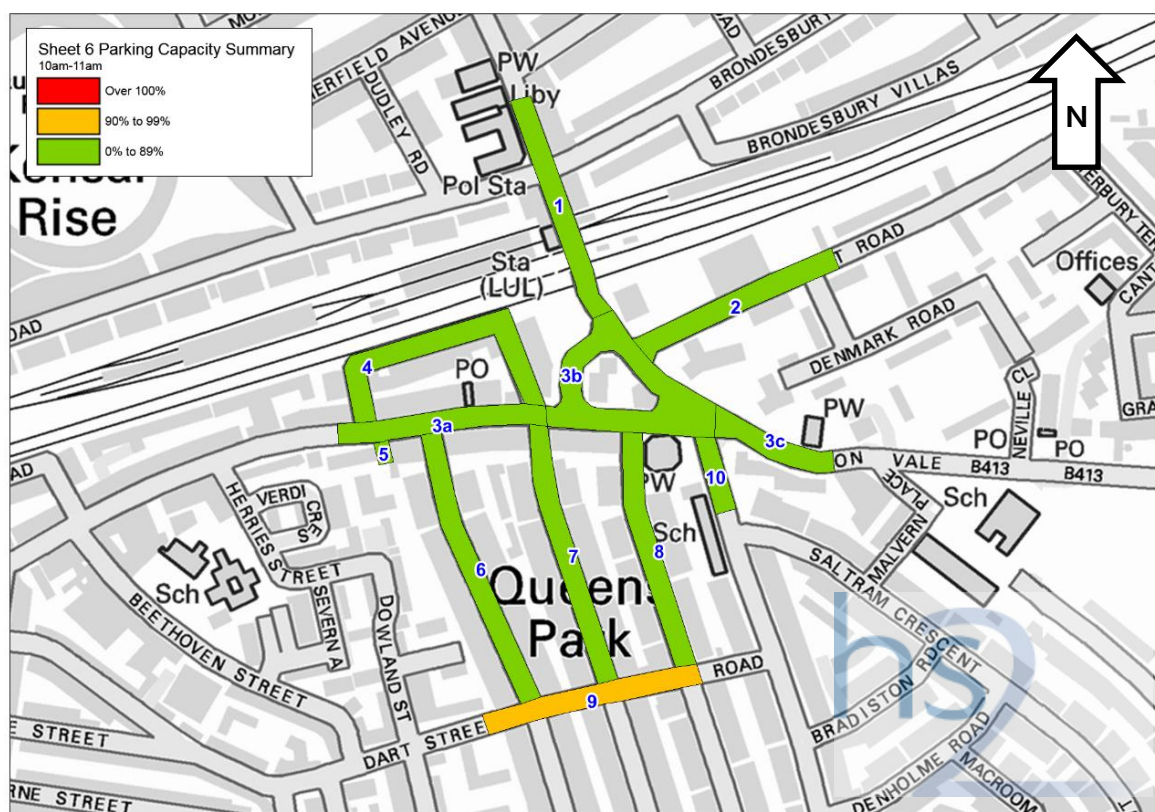
- 5.6.77 Parking restrictions on Old Oak Common Lane vary between single yellow lines (No waiting & no loading Monday – Saturday between 08:00- 18:30) and double yellow (No waiting and loading at any time). There are limited restriction-free areas available to the north of the existing over-bridges on Old Oak Common Lane.
- 5.6.78 There are no off-street public car parks in the immediate vicinity of Old Oak Common; however there is limited car parking available at the Old Oak Common depot for staff.

### *Parking surveys*

#### **Salisbury Road**

- 5.6.79 Parking surveys were undertaken on the sections of road shown in Figure 5-30 below on Thursday 5 July and Saturday 7 July 2012. The period chosen was pre-school holidays and Olympic Games period. The study dates were chosen to provide a typical weekday and weekend comparison of variation in parking demand. The surveys were undertaken between 05:00- 22:30.

Figure 5-30: Salisbury Road area parking survey location plan



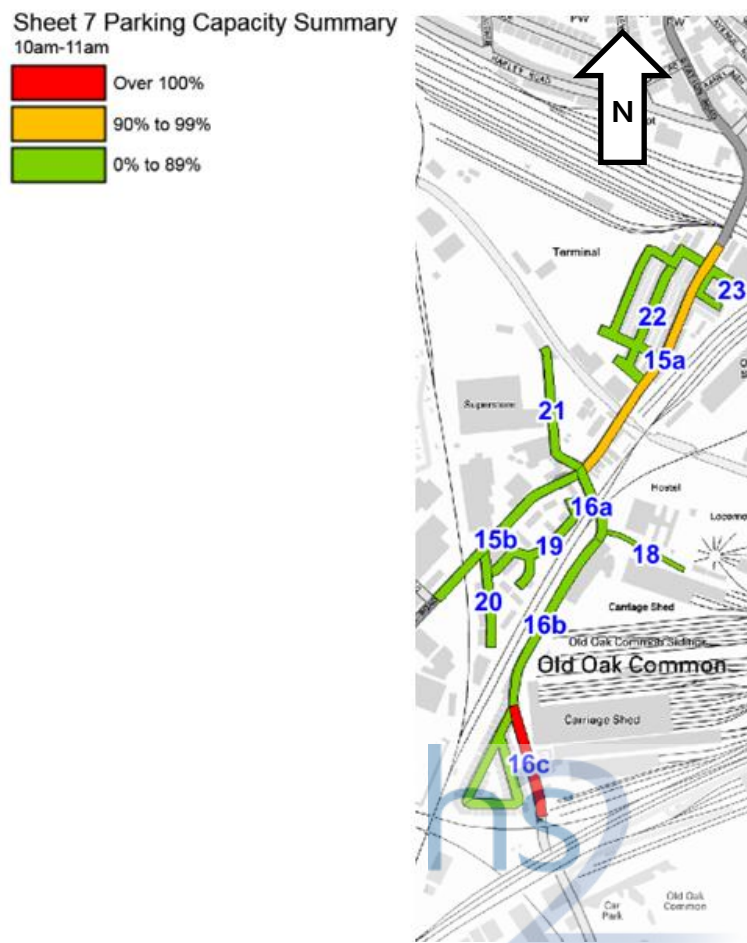
- 5.6.80 Claremont Road weekday parking demand was highest during the weekday being consistently over 90% of supply. Weekend demand was lower, commonly at around 60-70%.
- 5.6.81 Of all the streets surveyed, the section of Fernhead Road within the study area experienced the most parking stress by far. With a maximum of six places available, the highest recorded demand was 19 vehicles (319%). At no point during the survey was demand observed to fall below 100% and was consistently double the available provision.
- 5.6.82 Of the other streets in the survey area, only Marban Road and Portnall Road experienced spikes in demand that pushed parking activity over 100% for extended periods.

#### **Park Royal area (Old Oak Common, Victoria Road, Atlas Road and Willesden Euroterminal)**

- 5.6.83 Parking beat surveys were undertaken in streets close to the Old Oak Common works in July 2012. Surveys were undertaken on 10 streets to the west of the existing Old Oak Common Railway Depot on Thursday 5 July and Saturday 7 July 2012. The period chosen was pre-school holidays and Olympic Games period. The study dates were chosen to provide a typical weekday and weekend comparison of variation in parking demand. The surveys were undertaken between 05:00 and 22:30.



Figure 5-31 Old Oak Common area parking survey location plan



- 5.6.84 Of the streets surveyed, Victoria Road, Old Oak Common Lane, Atlas Road and the north entrance access road to the EWS Traction Maintenance Depot are mainly non-residential roads. Wells House Road, Shaftsbury Gardens, Goodhall Street, Stephenson Street, Channel Gate, Webb Place, Stoke Place and Crew Place are mainly residential streets.
- 5.6.85 A survey location plan and summary tables showing the demand against capacity for all roads survey over the study dates can be seen within the Baseline Survey Report in Annex B(ii).
- 5.6.86 The weekday and weekend parking occupancy levels recorded in streets near the Old Oak Common depot indicated spare capacity for most periods.
- 5.6.87 During the weekday, Wells House Road had an occupancy level over 90% during the night between 20:30 and 09:00. This suggests a pattern of activity of residents parking overnight, leaving for work in the morning and returning in the evening.
- 5.6.88 Parking demand was also high on Midland Terrace during the weekday lunchtime period between 12:00 and 13:30. Parking activity on the street remained consistently under capacity for the rest of the survey period.



- 5.6.89 Weekend parking demand was lower in comparison to the recorded weekday levels. Of all surveyed streets, Wells House Road had the highest parking occupancy level throughout the weekend survey period and approached over-capacity at 23:30.

### **Public transport**

- 5.6.90 The study area is well served by public transport, LU, London Overground, bus and coach connections. The following sections describe the rail, bus and coach services in the area.

### *Rail network*

- 5.6.91 The key railway station in the area is Paddington, which is located 5km to the east of the Old Oak Common main compound. It is one of the principal stations on the Great Western Main Line (GWML), which passes directly through Old Oak Common rail depot and provides access to National and local rail services.
- 5.6.92 A Parliamentary railway line between Paddington and Gerrard's Cross passes through the Old Oak Common Area. Service runs at a frequency of one train a day with the purpose of safeguarding the line from potential closure.

### **Salisbury Road area**

- 5.6.93 The Salisbury Road site is located immediately to the south and west of Queen's Park station which is a joint LU (Bakerloo Line) and London Overground station located at the southern end of Salisbury Road.
- 5.6.94 The Office of Rail Regulation statistics estimate that approximately 3.5 million passengers travel through the station annually. Trains to Euston, Watford Junction and intermediate stations via London Overground line operate from Queen's Park.

### **Park Royal area (Old Oak Common, Victoria Road, Atlas Road and Willesden Euroterminal)**

- 5.6.95 The nearest LU and mainline stations to the Old Oak Common site are as follows:
- East Acton LU station – approximately 0.8km to the south
  - North Acton LU station – approximately 0.5km to the east
  - Acton Mainline National Rail station - approximately 1.3km to the south east
  - Willesden Junction LU and National Rail stations – approximately 1km to the north
- 5.6.96 Willesden Junction station is located to the east of the Willesden Euroterminal/Atlas Road sites and Harlesden station lies to the west.

- 5.6.97 Estimated rail passenger station entry and exit flows have been derived from NR and LUL information and are summarised in Table 5-70 below.

Table 5-70: Kilburn (Brent) to Old Oak Common – local station entry exit counts

Station name	Station type	Estimated 3hr AM peak (00:07 – 00:10)	Estimated annual entries and exits (2010/11)
Kilburn Park	LUL	3,254	3,455,765
Queen's Park	Overground + LUL	5,207	9,116,317
North Acton	LUL	4,371	4,641,664
East Acton	LUL	3,210	3,408,355
Acton Main Line	NR	327	346,756

### *Local bus services*

- 5.6.98 The local bus network is shown on Figure 5-32 and Figure 5-33. There are a wide range of bus services operating in the local area.

### **Salusbury Road area**

- 5.6.99 Five bus routes with a combined frequency of around 40 buses per weekday morning peak hour serve the Salusbury Road gyratory area providing connections to the City of London, New Cross, Shepherds Bush, Park Royal, Wembley, Cricklewood and Finchley. In total there are five services, of which two operate 24 hours.

Table 5-71: Salusbury Road area bus frequencies

Service number	Route	AM peak (buses/hr)	Inter-peak (buses/hr)	PM peak (buses/hr)
6	Aldwych – Willesden	11	11	11
36	New Cross	11	11	11
187	Finchley Road – Park Royal	6	6	6
203	Kilburn Park – Wembley Park	4	4	4
316	Cricklewood – White City	7	8	7

Source: derived from TfL bus information

*Park Royal area (Old Oak Common, Victoria Road, Atlas Road and Willesden Euroterminal)*

- 5.6.100 Existing bus connections within Old Oak Common Lane are limited due to the existing bridge height clearances on Old Oak Common Lane restricted to 3.8metres. While a total of four bus services operate along Old Oak Common Lane, only the single-deck Route 228 passes along the entire length of Old Oak Common Lane from Victoria Road to the north to the A40 Westway/Western Avenue in the south. This runs at a frequency of around five buses per hour during Monday to Saturday peak periods and three per peak hour on Sundays and public holidays.
- 5.6.101 The remaining three services; routes 7, 72 and 283 start and terminate from Brunel Road to the south of the GWML and Parliamentary Line railway bridges.
- 5.6.102 Bus route 226 between Brent Cross and Hammersmith runs along Victoria Road with a weekday morning peak hour frequency of around six buses in each direction. Bus route 440 between Stonebridge Park and Gunnersbury runs along Chase Road with a weekday morning peak hour frequency of around four buses in each direction.

Table 5-72: Old Oak Common area bus services

Service number	Route	AM peak (buses/hr)	Inter-peak (buses/hr)	PM peak (buses/hr)
<b>Serving Willesden Junction</b>				
18	Euston - Sudbury	30	30	30
220	Wandsworth - Willesden Junction	12	10	10
228	Central Middlesex Hospital - Maida Hill	6	6	6
266*	Brent Cross - Hammersmith	10	10	10
487*	South Harrow	5	4	4
<b>Serving North Acton</b>				
95	Shepherd's Bush - Southall	6	6	6
260	Golders Green - White City	6	6	6
266*	Brent Cross - Hammersmith	10	10	10
440	Gunnersbury - Stonebridge	5	4	4
487*	South Harrow - Willesden Junction	4	4	4
<b>Serving East Acton</b>				
7	East Acton - Russell Square	9	8	8
72	East Acton - Roehampton	8	7	8
283	East Acton - Barnes	8	8	7

Source: derived from TfL bus information

Figure 5-32: Bus routes that serves Queen's Park and surrounds

Buses from Queen's Park



Figure 5-33 Bus Routes that serves Old Oak Common and Surrounds

# Buses from Willesden Junction Station

## Key

- Connections with Underground
- Connections with National Rail
- Mondays to Saturdays only

Red discs show the bus stop you need for your chosen bus service. The disc **1** appears on the top of the bus stop in the street (see map of town centre in centre of diagram).

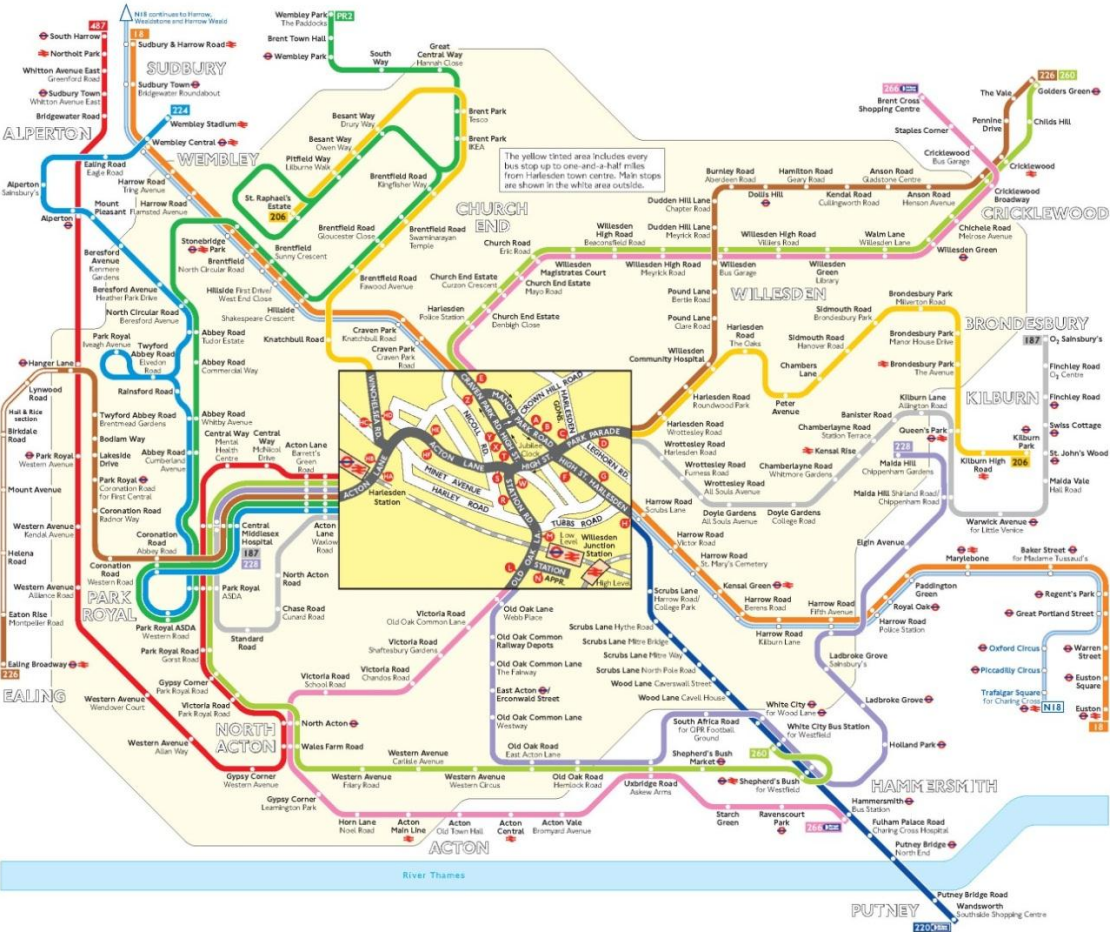
## Route finder

### Day buses including 24-hour routes

Bus route	Towards	Bus stops
<b>18</b>	Euston	1 2 3 4
<b>187</b>	Sudbury	1 2 3 4
	Central Middlesex Hospital	1 2 3 4
<b>206</b>	Finchley Road	1 2 3 4 5 6 7 8
	Kilburn Park	1 2 3 4 5 6 7 8
	St. Raphael's Estate	1 2 3 4 5 6 7 8
<b>220</b>	Wandsworth	1 2 3 4 5
<b>224</b>	Wembley	1 2 3 4 5 6 7 8
<b>226</b>	Ealing Broadway	1 2 3 4 5 6 7 8
	Golders Green	1 2 3 4 5 6 7 8
<b>228</b>	Central Middlesex Hospital	1 2 3 4 5 6 7 8
<b>260</b>	Maida Hill	1 2 3 4 5 6 7 8
	Golders Green	1 2 3 4 5 6 7 8
<b>266</b>	White City	1 2 3 4 5 6 7 8
	Brent Cross	1 2 3 4 5 6 7 8
<b>487</b>	Hammersmith	1 2 3 4 5 6 7 8
<b>PR2</b>	South Harrow	1 2 3 4 5 6 7 8
	Wembley Park	1 2 3 4 5 6 7 8

### Night buses

Bus route	Towards	Bus stops
<b>N18</b>	Harrow Weald	1 2 3 4
	Trafalgar Square	1 2 3 4



### *Coach services*

- 5.6.103 There are no dedicated coach service facilities in the vicinity of the study area. Long distance coach services, primarily using the A40, operate from hubs at Heathrow Airport (approximately 15km south west of Old Oak Common) and at Victoria Coach Station (approximately 8km south east of Old Oak Common) serving key destinations across the UK. These services are principally operated by National Express.

### *Taxis*

- 5.6.104 There are no major dedicated taxi facilities on the public highway in the vicinity of the study area. However, this does not preclude the ability to pick-up/set down in these areas.

### *Public transport interchanges*

- 5.6.105 The multi-modal interchanges within Kilburn (Brent) to Old Oak Common area are described below.

#### **Salusbury Road area**

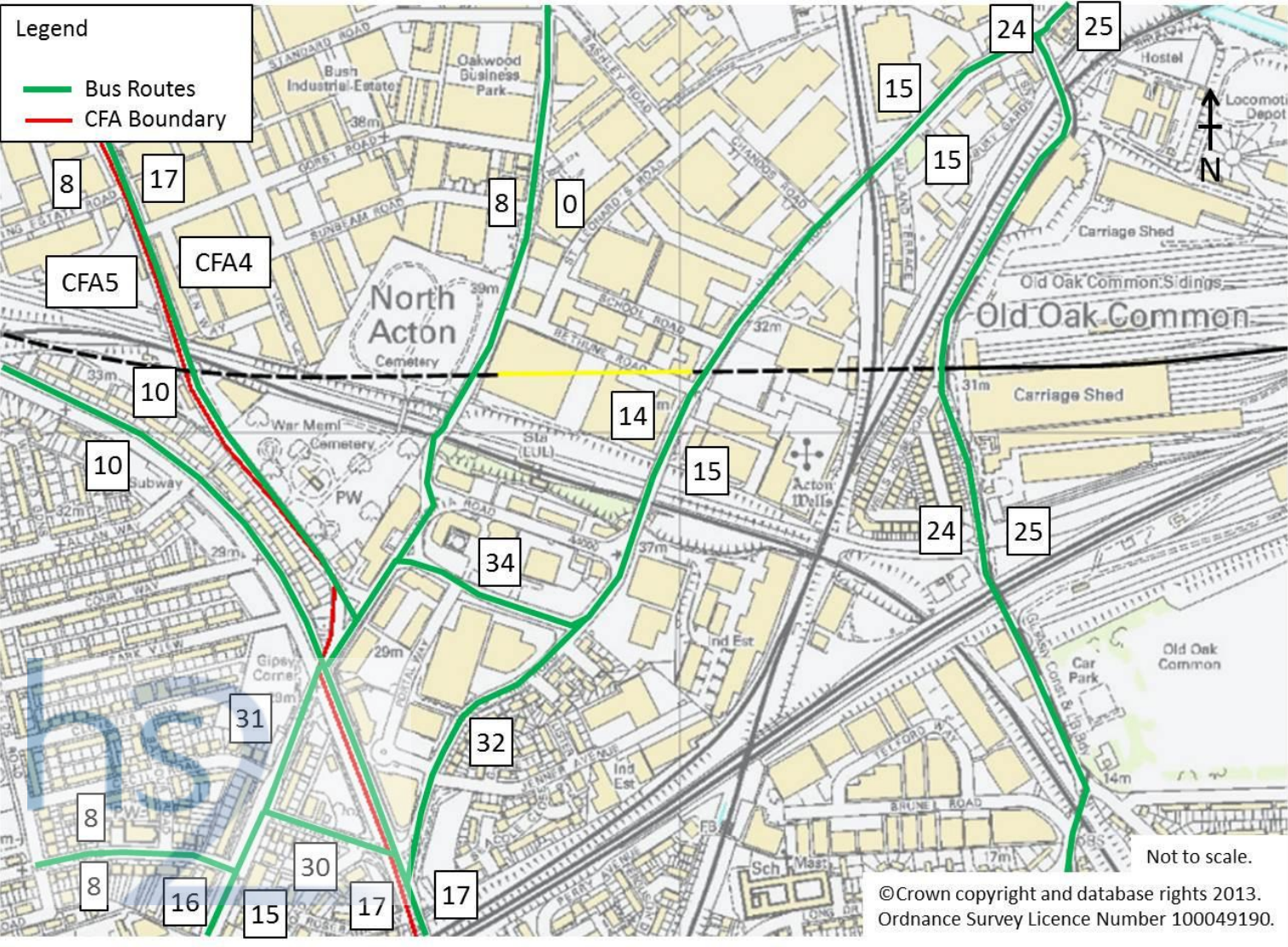
- 5.6.106 Interchange at Queen's Park station is provided between London Overground, Bakerloo underground line and local buses. The station is accessed from the northern side of the rail bridge connecting with Salusbury Road.
- 5.6.107 No buses stop directly outside the station entrance; however interchange is possible between the station and bus stops K and L located to the north of the station on Salusbury Road and at bus stops B and D on Premier Corner and Claremont Road respectively.

#### **Park Royal area (Old Oak Common, Victoria Road, Atlas Road and Willesden Euroterminal)**

- 5.6.108 Routes 7, 72 and 283 start and terminate from bus stop O, located on Brunel Road. A total of six bus stand spaces are located along Telford Way and Brunel Road.



Figure 5-34: Kilburn (Brent) to Old Oak Common area - typical AM peak hour local bus flows WELHAM



## **Pedestrians, cyclists and equestrians**

- 5.6.109 The following section describes the pedestrian and cycle facilities within the Kilburn (Brent) to Old Oak Common study area. The study area is well served by pedestrian and cycle facilities as is typical of an urban area.

### *Pedestrian facilities*

#### **Salusbury Road area**

- 5.6.110 There is a three-arm zebra crossing on Kilburn Lane at the junction with the gyratory.
- 5.6.111 At present there are no crossing facilities outside Queen's Park station. Extensive sections of pedestrian guard railing are installed on either side of the rail overbridge carrying Salusbury Road over the railway. The adjacent parapets are protected by transportation (trierf) kerbs. The footway immediately outside the station is cluttered with street furniture. Intermittent short sections of guard rail are also located at the Salusbury Road/Harvist Road/Brondesbury Road junction to the north of the site and the junctions to the south; Salusbury Road/B413 Kilburn Road/Claremont Road gyratory and Salusbury Road/Albert Road. These junctions also have poor crossing facilities, particularly for people with restricted mobility.
- 5.6.112 Four-way push button pedestrian crossing facilities are located at the Salusbury Road/Harvist Road traffic signalised junction.
- 5.6.113 There are zebra crossings in the following locations;
- Salusbury Road north of the junction with Victoria Road (with east side footway build-out) and,
  - Kilburn Lane/Claremont Road – 3 way crossing incorporating triangular refuge between Bravington Road and Portnall Road.

#### **Park Royal area (Old Oak Common, Victoria Road, Atlas Road and Willesden Euroterminal)**

- 5.6.114 The T-junction of Old Oak Common with Wells Rise is uncontrolled and is very wide. While dropped kerbs are present, no tactile paving is installed at the crossing. Further south a section of pedestrian guardrail is installed on the western side of Old Oak Common Lane beneath the northern railway bridge.
- 5.6.115 The central bridge has no footway on the eastern side and pedestrians are required to cross over to the western side in order to proceed beneath the bridge. An uncontrolled central refuge facility with tactile paving is located approximately 10m north of the northernmost bridge and provides an opportunity to cross.

- 5.6.116 The western footway passing under the central and southern bridges is narrow and has a section of pedestrian guard rail adjacent to the carriageway. The eastern footway recommences under the southern bridge but terminates again approximately 15m south of the southern railway bridge.
- 5.6.117 A pelican crossing is located approximately 60m south of the southern railway bridge to allow pedestrians to cross to the western side. However, the general pedestrian environment in this location is poor, particularly for the mobility-impaired.
- 5.6.118 The junction with Wulfstan Street to the south of the railway bridges is exceptionally wide and has no pedestrian facilities.
- 5.6.119 The northern section of old Oak Common Lane between Wells Road and Victoria Road has footways either side of the carriageway, with no crossing facilities. The road bridge over the railway line at the northern end of Old Oak Common Lane has transport (Trieft) kerbs and pedestrian guard railing to protect the parapets.
- 5.6.120 Push button pedestrian crossing facilities are located at the following traffic signalised junctions;
- four- way crossing at Old Oak Common Lane/Victoria Road/Atlas Road/Old Oak Lane (exceptionally large junction with sections of guard rail and staggered pedestrian facilities on the Atlas Road and Victoria Road Arms);
  - two-way crossing at signalised T-junction of Scrubbs Lane/North Pole Lane/Wood Lane (Scrubbs Lane northern arm and North Pole Lane Arm); and
  - two-way crossing at signalised T-junction of Wood Lane and Du Cane Road (Wood Lane southern arm and Du Cane Road arm).
- 5.6.121 A Pelican crossings is installed 60m south of the southern Old Oak Common Lane railway bridge (with tactile paving and short sections of guard rail).
- 5.6.122 Zebra crossings are installed in the following locations:
- Old Oak Common north of the junction with The Fairway;
  - Scrubbs Lane north of Mitre Way; and
  - Scrubbs Lane north of Hythe Road.
- 5.6.123 Raised junction tables are located at the junctions of:
- Old Oak Common/Fitzneal Street;
  - Wood Lane Nascott Street;
  - Wood Lane/Glenroy Street; and
  - Wood Lane/Shinfield Street (Road closed and footway extended across junction).

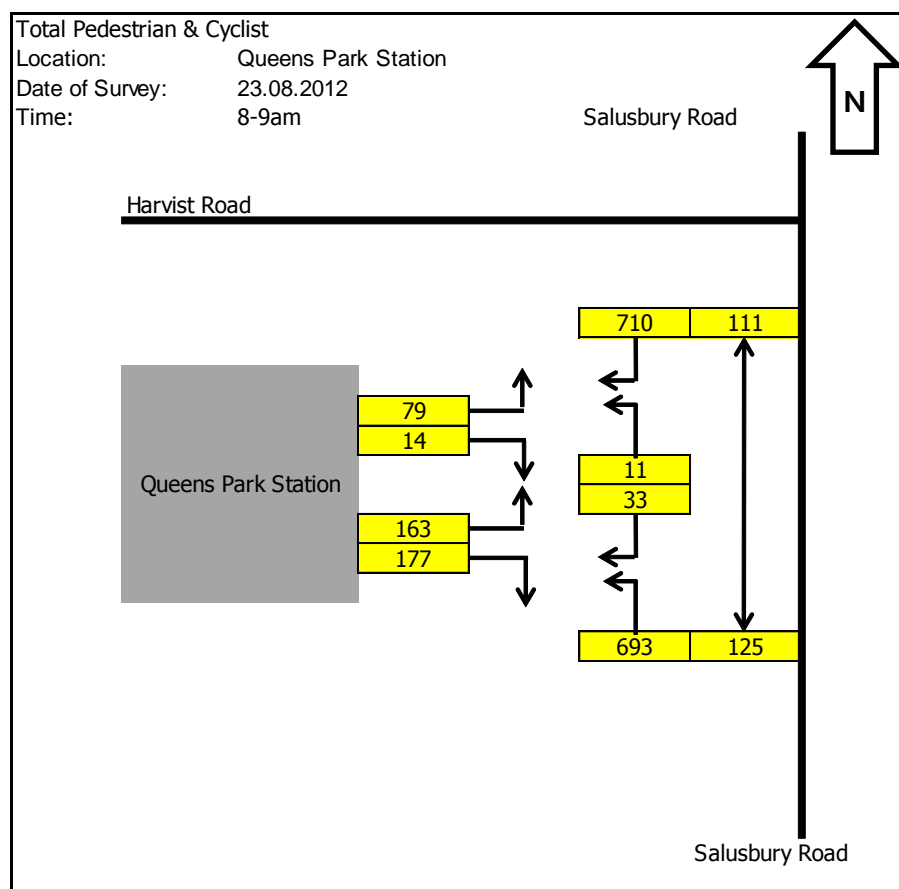
- 5.6.124 Uncontrolled pedestrian central refuge crossings are installed in the following locations:
- Old Oak Common 10m south of Wells House Road junction;
  - Old Oak Common 10m north of Old Oak Common northern railway bridge;
  - Old Oak Common approximately 40m south of the junction with Long Drive; and
  - Scrubs Lane approximately 60m north of junction with Hythe Road.

### *Non-motorised user flows*

#### **Salisbury Road area**

- 5.6.125 Utilities diversion works at the Salisbury Road/Kilburn Lane junction over an extended period have precluded detailed pedestrian surveys. However, weekday pedestrian counts from 08:00 to 09:00 were undertaken in August 2012 to record in-flows and out-flow at Queen's Park Station and a summary of this information is presented in Figure 5-35 below.

Figure 5-35: Typical weekday AM peak pedestrian movements in the vicinity of Queen's Park Station



## Park Royal area (Old Oak Common, Victoria Road, Atlas Road and Willesden Euroterminal)

- 5.6.126 Typical weekday morning (08:00 – 09:00) pedestrian movements in the vicinity of the proposed Old Oak Common site are shown on Figure 5-36. An example of typical footway and pedestrian crossing flow survey results is also shown in Figure 5-37. The Baseline Survey Report provides further data for other time periods in Annex B(ii).

Figure 5-36: Typical weekday AM peak pedestrian movements in vicinity of Victoria Road

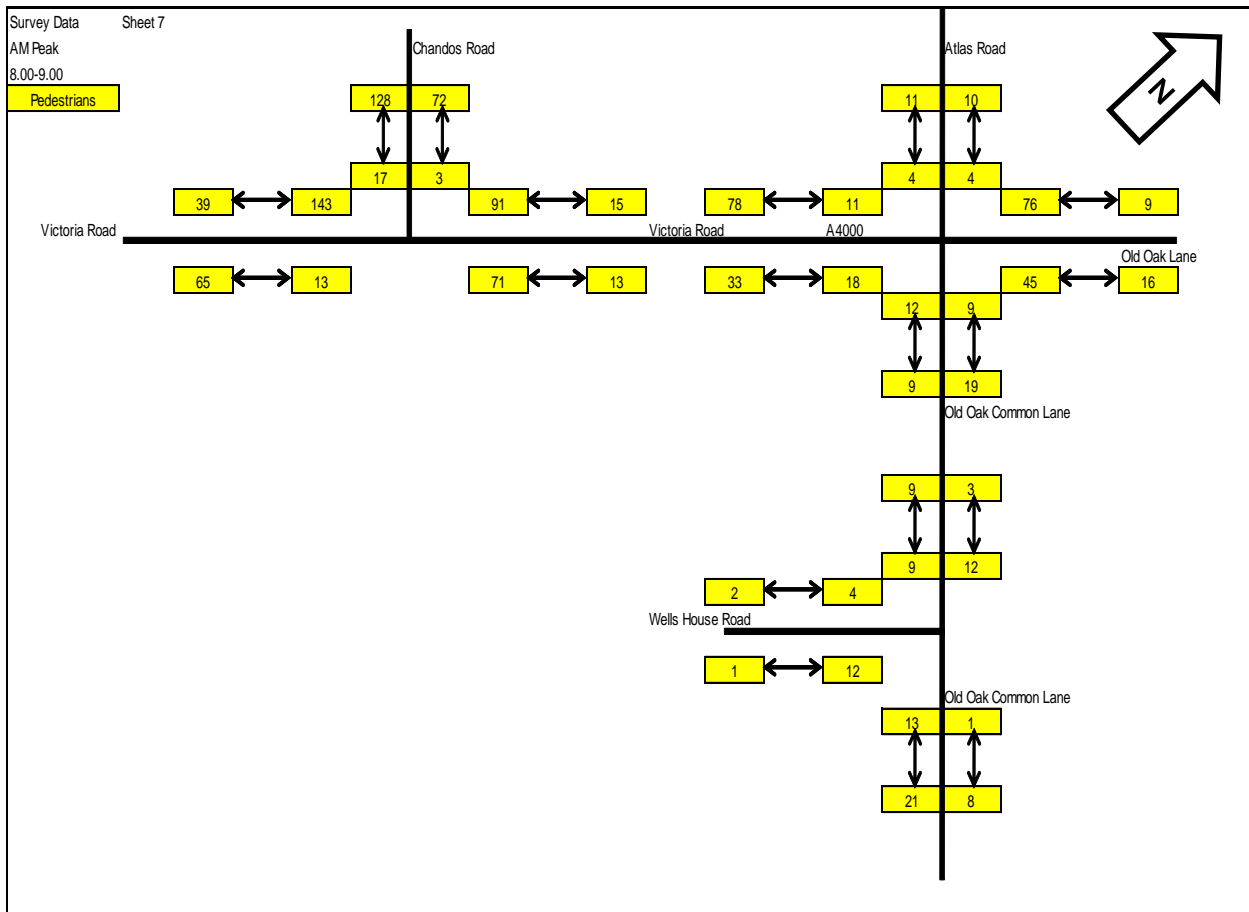
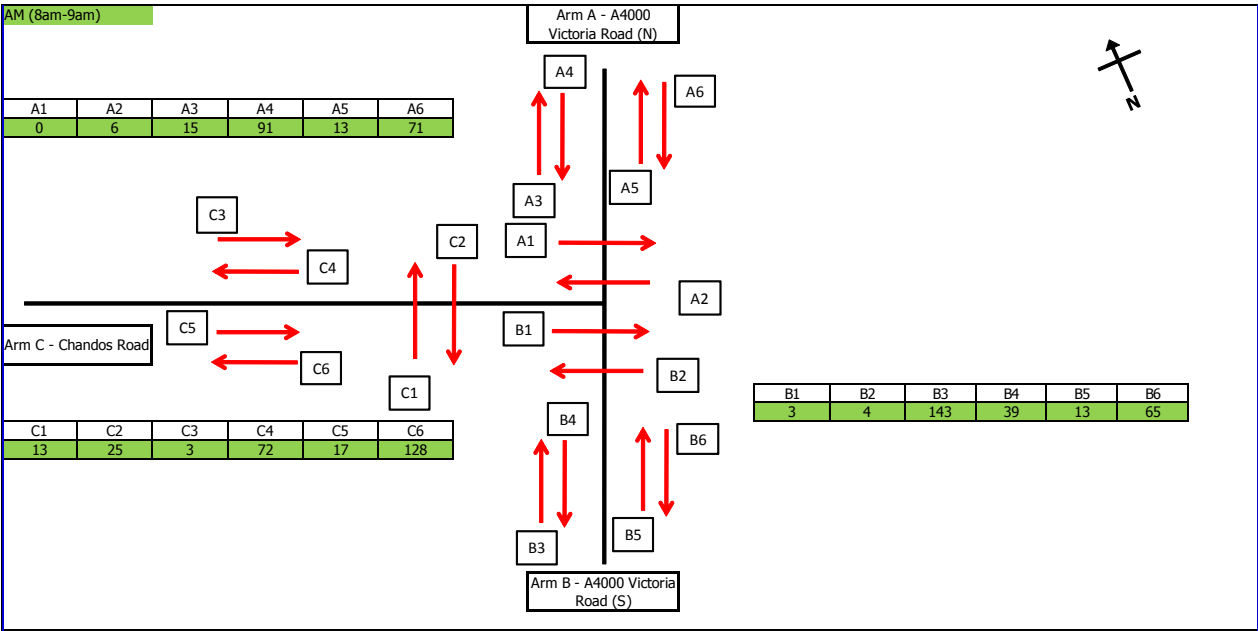
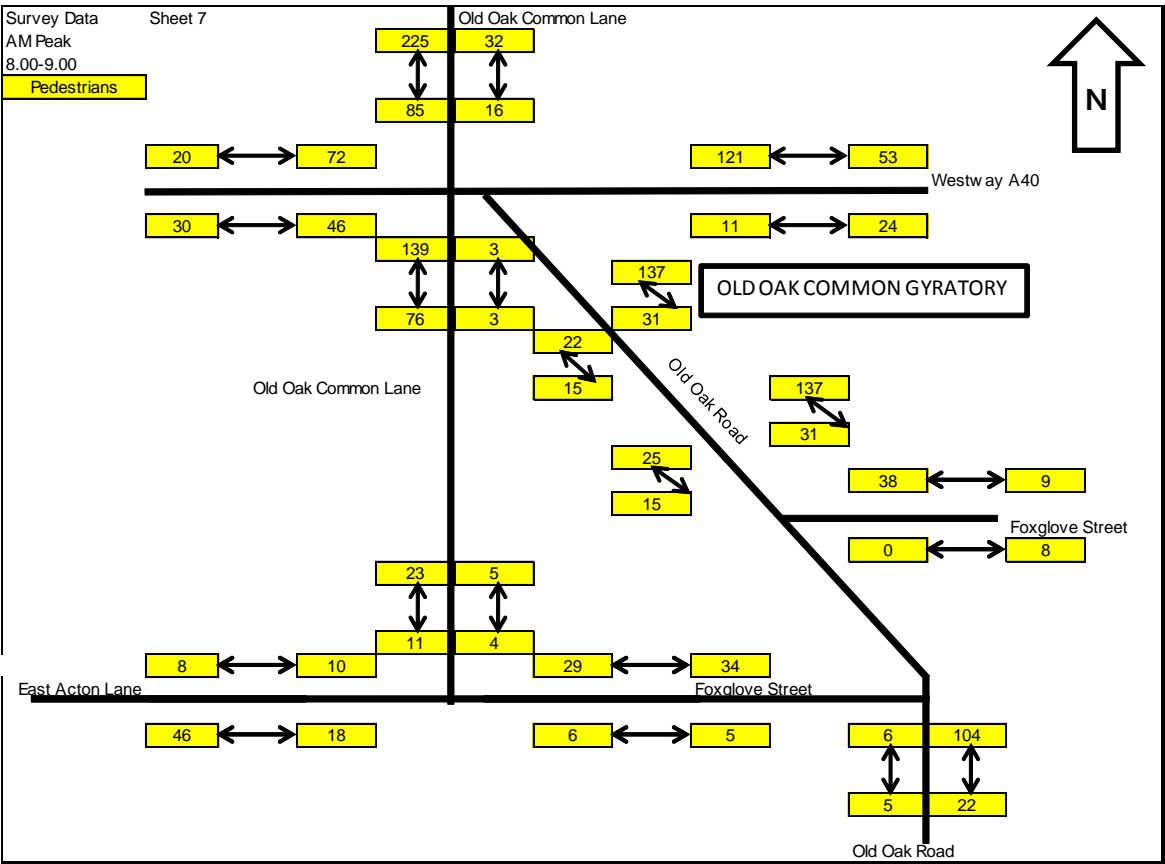


Figure 5-37: Typical weekday AM peak pedestrian crossing movements in vicinity of Old Oak Common



5.6.127 Typical weekday morning (08:00 – 09:00) pedestrian movements to the southern end of Old Oak Common Lane in the vicinity of the A40 and gyratory are shown in Figure 5-38.

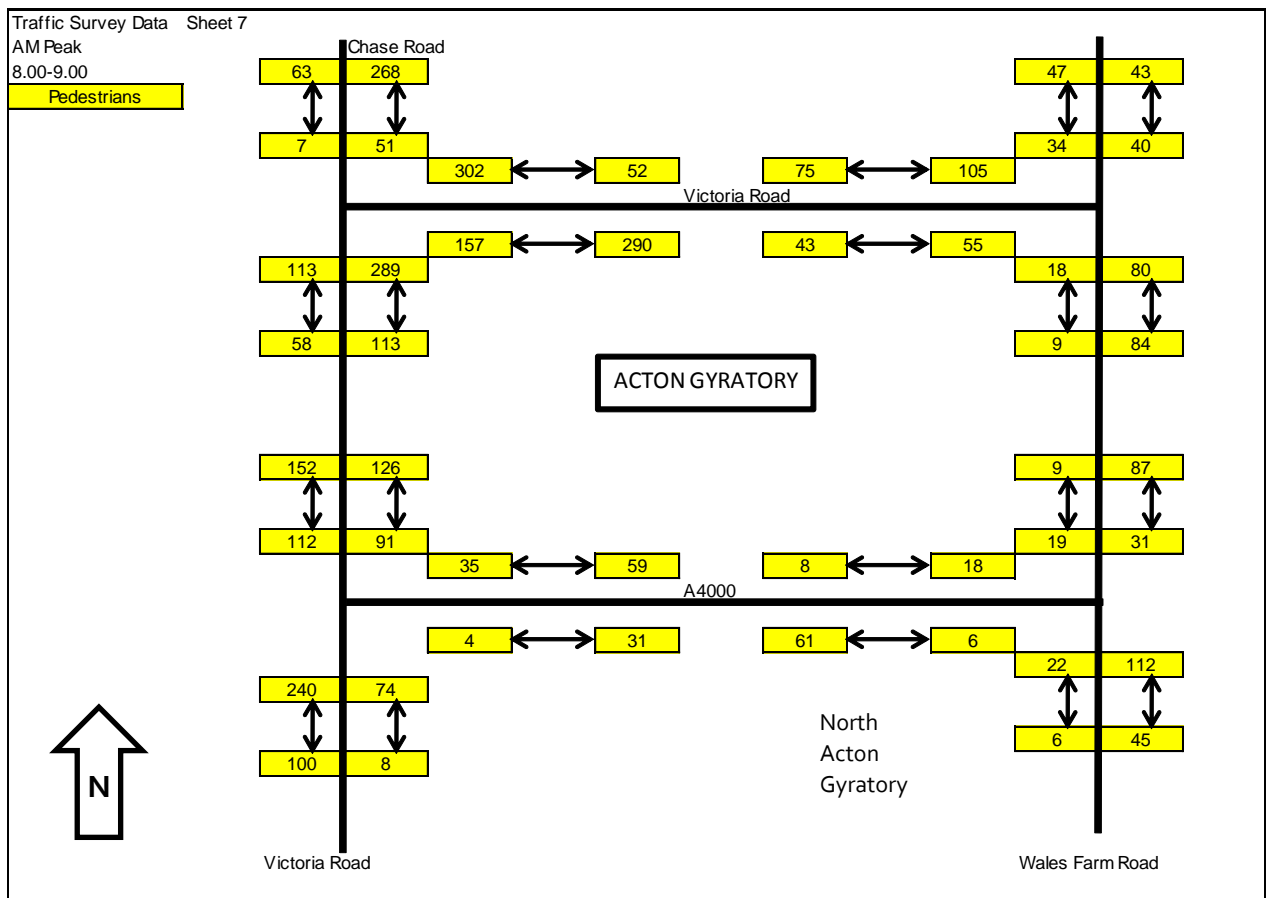
Figure 5-38: Typical weekday AM peak pedestrian movements in vicinity of Old Oak Common Gyratory



5.6.128 Typical weekday AM peak (08:00 – 09:00) pedestrian movements at the Acton Gyratory to the west of Old Oak Common are shown Figure 5-39.



Figure 5-39: Typical weekday AM peak pedestrian movements in vicinity of North Acton Gyratory



5.6.129 It can be seen that, of the locations surveyed, Old Oak Common Lane immediately north of the A40 experiences one of the highest levels of pedestrian movements.

5.6.130 The figures show the peak hour AM pedestrian flows derived from the data contained in the Baseline Survey Report. Typically daily flows will be 10 times these shown above.

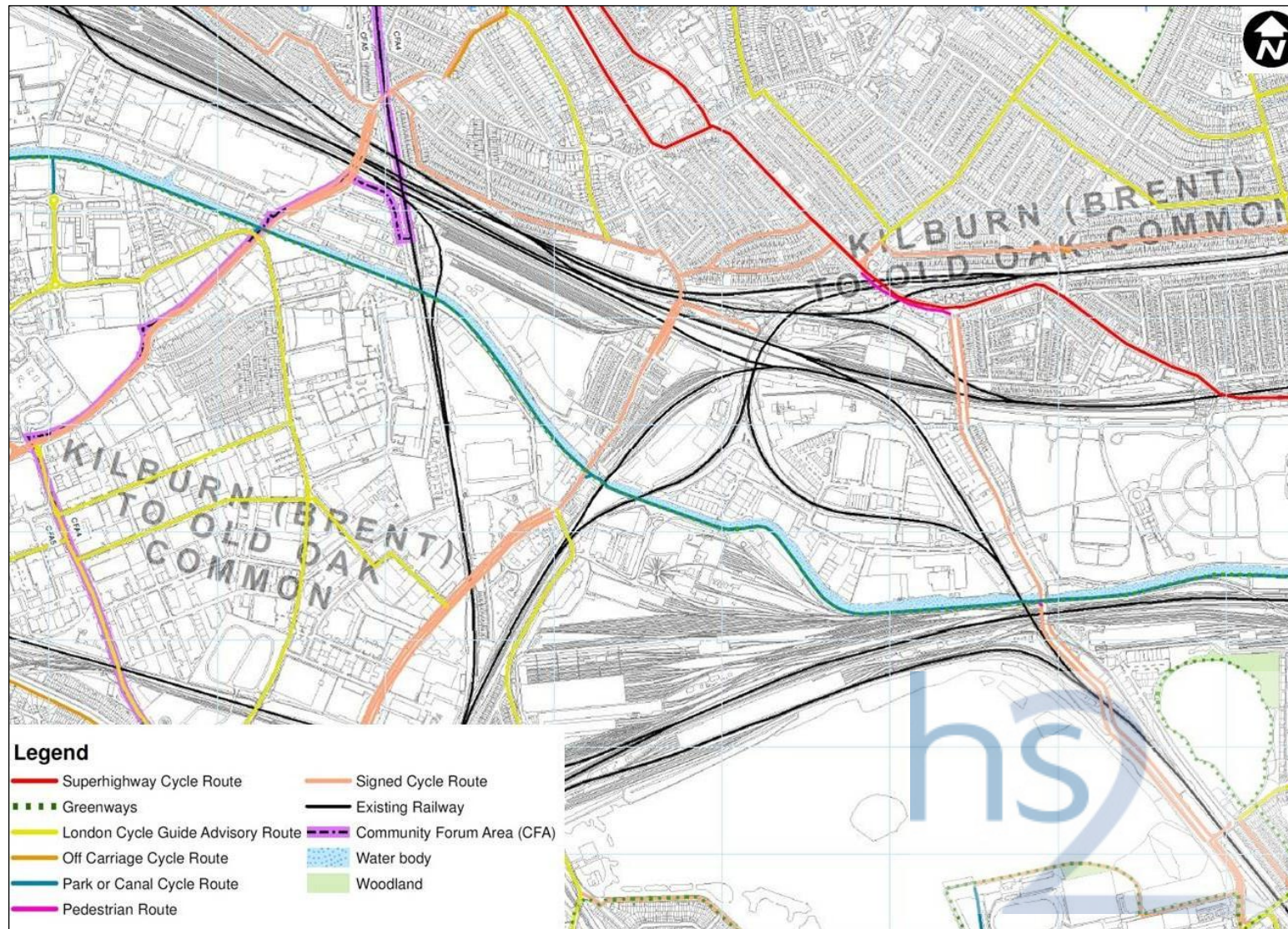
### Cycle Facilities

5.6.131 The cycle routes within Kilburn (Brent) to Old Oak Common area are shown on Figure 5-40.

### Salisbury Road

5.6.132 Salisbury Road is not on a dedicated cycle route; however it is part of a network of quieter roads that have been recommended for cyclists linking to signed cycle routes. There are some cycle storage facilities at Queen's Park station.

Figure 5-40: Cycle routes within Kilburn (Brent) to Old Oak Common study area



- 5.6.133 There are no formal cycle lanes in the area, or any bus lanes that can be used by cyclists.
- 5.6.134 ASLs are installed at the junction of Salusbury Road/Harvist Road/Brondesbury Road.
- 5.6.135 On-street cycle stands are installed in the following locations:
- Salusbury Road western side immediately south of the railway overbridge – nine stands;
  - Harvist Road northern side at junction with Salusbury Road – 21 stands;
  - North and south sides of Brondesbury Road at junction with Salusbury Road – six stands;
  - Salusbury Road east and west sides south of Harvist Road/Brondesbury Road – four stands;
  - West side of Salusbury Road between Summerfield Avenue and Victoria Road – six stands;
  - Junction of Salusbury Road/Victoria Road – one stand.

**Park Royal area (Old Oak Common, Victoria Road, Atlas Road and Willesden Euroterminal)**

- 5.6.136 Old Oak Common Lane is a quieter road recommended for cyclists which connects to signed cycle routes. The A4000 Victoria Road and Old Oak Lane which connects with Old Oak Common Lane to the north is a signed cycle route.
- 5.6.137 Cycle facilities in the Old Oak Common Lane area (western side) are minimal and there are no dedicated cycle stands, cycle lanes or bus lanes in the immediate vicinity of the site.
- 5.6.138 Cycle provision in the Scrubs Lane area (eastern side) is better with both cycle and bus lanes available. Cyclists are also permitted to pass between Shinfield Street and Wood Lane close to the Westway on the eastern side which is otherwise closed to general traffic.
- 5.6.139 Cyclists are permitted to use the bus lanes installed in the following locations:
- Scrubs Lane western side from approximately 40m south of railway overbridge to approximately 40m north of North Pole Road; and
  - Wood Lane northbound commencing 40m from The Westway junction for approximately 50m.
- 5.6.140 ASLs are provided in the following locations:
- Old Oak Common Lane/Victoria Road/Atlas Road/Old Oak Lane; and

- Scrubs Lane junction with North Pole Road – Southbound Scrubbs Lane approach.

5.6.141 Cycle lanes are installed in the following locations:

- Victoria Road – extensive sections of both advisory and mandatory lanes in each direction;
- Old Oak Lane – extensive advisory lanes in each direction;
- Mitre Lane – extensive advisory lanes in each direction;
- Wood Lane – extensive advisory sections in each direction; and
- Wood Lane – Advisory mid-carriageway cycle lane southbound approaching The Westway providing route southbound through The Westway underpass.

5.6.142 A greenway cycle route is located on the towpath along the southern side of the Grand Union Canal. Access to the tow path from the road network is available at the A4000 Old Oak Common Lane, A219 Scrubs Lane and B450 Ladbroke Grove.

### *Equestrian facilities*

5.6.143 The Wormwood Scrubs Pony Centre is located on Wormwood Scrubs Park and is accessed via Scrubs Lane. Riding lessons are undertaken using the ponies kept at the centre and within the premises, with no impact on the surrounding network.

### **Waterways/canals**

#### *Salisbury Road*

5.6.144 The Grand Union Canal is located around 780m to the south of the Salisbury Road works.

#### *Park Royal area (Old Oak Common, Victoria Road, Atlas Road and Willesden Euroterminal)*

5.6.145 The Grand Union Canal passes to the north of Old Oak Common. It comprises a number of canal trunk-routes, linking London to Birmingham. Many branches lead off from the canal, including the Paddington Arm, which passes under the proposed route.

### **Air transport**

5.6.146 There are no airports in the immediate vicinity of the Proposed Scheme from Kilburn to Old Oak Common.

## 5.7 Northolt Corridor (CFA5)

### Study area

- 5.7.2 This section provides an overview of the baseline traffic and transport conditions for the Proposed Scheme that passes through the Northolt Corridor area from Park Royal Road to Rabournmead Drive.
- 5.7.3 It describes the transport infrastructure within the CFA, which would be affected either by the construction or operation of the Proposed Scheme. For this area, the baseline conditions relate to the transport network affected by construction of the proposed tunnel vent shafts at West Gate, Greenpark Way and Mandeville Road.
- 5.7.4 The scope of work and study area has been discussed with the key transport authorities including TfL and the LBE.
- 5.7.5 The road network study area for the Northolt Corridor includes the Western Avenue (A40), A406 North Circular Road, A4127 Greenford Road and A312 Mandeville Road. The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFA5 Report), the core study area within the CFA boundary and the main road network can be seen in Figure 5-41 and Figure 5-42.
- 5.7.6 For ease of reference the baseline transport conditions for each mode are generally described from east to west along the proposed route.



Figure 5-41: Northolt Corridor study area east

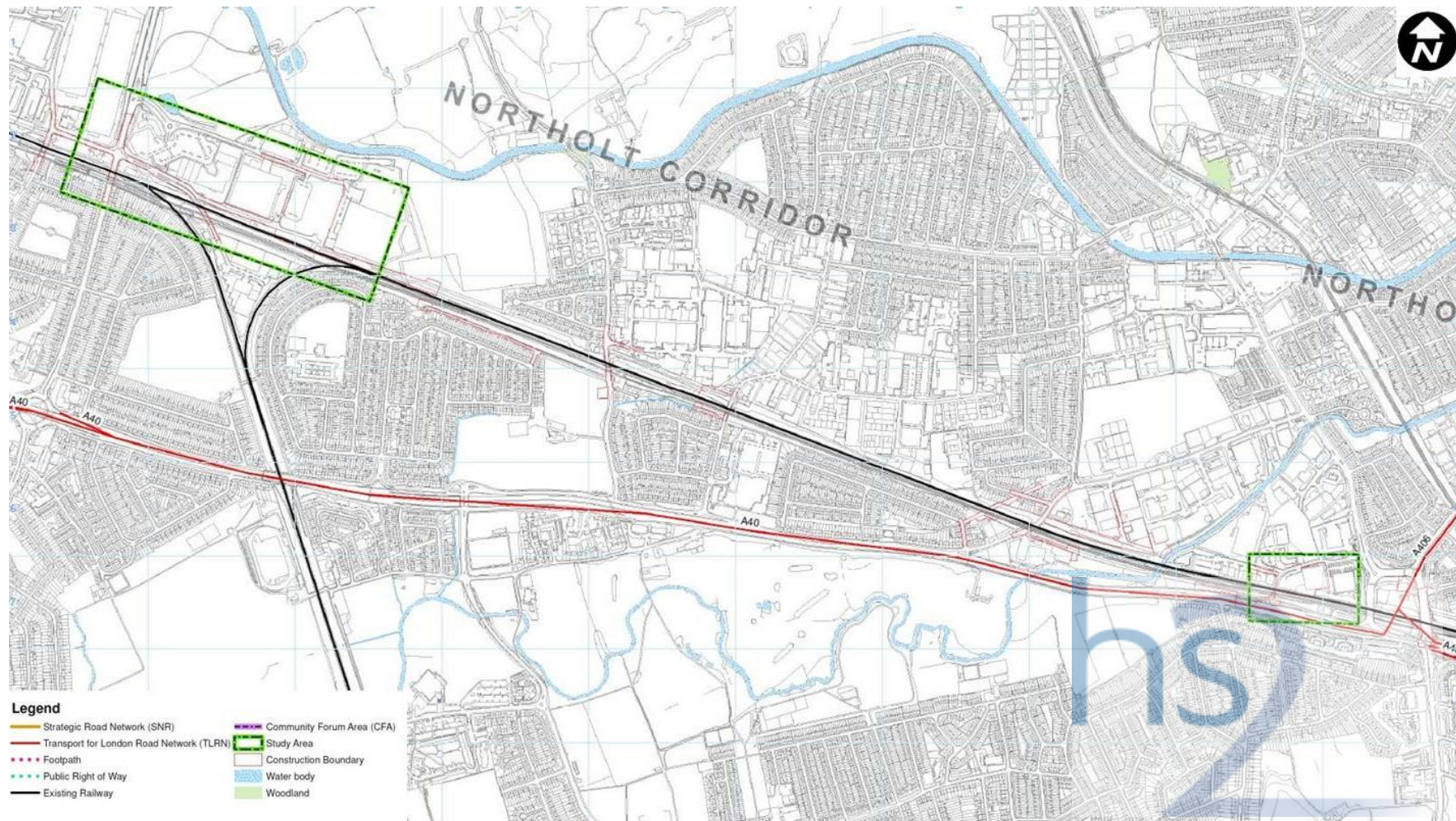
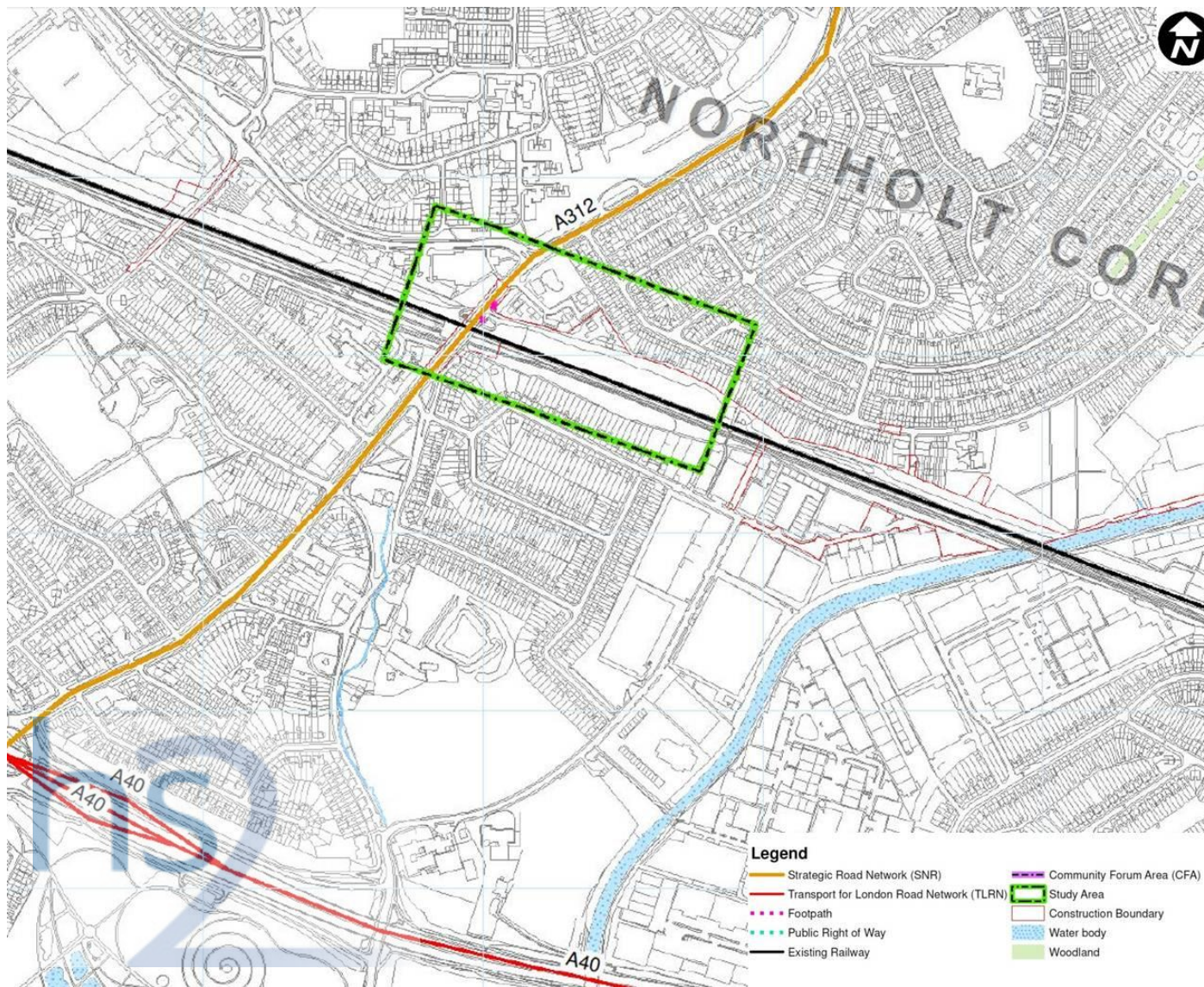




Figure 5-42: Northolt Corridor study area west



## Local land uses

- 5.7.7 The Proposed Scheme passes through primarily suburban residential, retail and light industrial land uses within the study area.

### *West Gate*

- 5.7.8 The West Gate site compound lies within the LBE. The site is located directly adjacent to the existing railway line and just to the north of A40 Western Avenue. The land use to the north of the site is largely business-related and the majority of the land use to the south of the site is residential.

### *Greenpark Way*

- 5.7.9 The Greenpark Way site compound lies within the LBE. The site lies to the north of the existing railway line and access and egress is achieved from Rockware Avenue and Lyon Way. Land use in the immediate area is predominately business and it is primarily retail to the west towards Greenford Road.

### *Mandeville Road*

- 5.7.10 The land use to the south of the Mandeville Road site compound is largely residential. There is a public leisure centre located close to the site and the majority of the land use beyond this is residential.

## Surveys

- 5.7.11 Traffic, non-motorised user and station surveys were undertaken in the three-weeks between 18 June-6 July 2012 during a period which avoided the effect of the Hammersmith Flyover emergency closure, National holidays (including the Queen's Jubilee and Royal Wedding) and also the Olympics & Paralympics period. Non-motorised user and station surveys were undertaken in September 2012. The survey locations are shown within the Baseline Survey Report in Annex B(ii).

### *Traffic surveys*

- 5.7.12 The traffic surveys comprised:
- MCC at highway junctions were undertaken on a weekday between 07:00-10:00; 11:00-14:00; and 16:00-19:00 and on a Saturday between 10:00-14:00;
  - traffic signal staging - green time, inter-green and cycle time data was obtained from TfL. Saturation flow surveys at signal controlled junctions were undertaken for the same time periods as the MCCs;
  - ATC on highway links across the study area. ATC data was gathered for a continuous two-week period to coincide with the date of the MCCs; and
  - parking accumulation within the vicinity of the planned worksites was recorded from 05:00-22:30 at 30-minute intervals on a weekday and at the

weekend;

### *Non-motorised user surveys*

- 5.7.13 Non-motorised user surveys were undertaken to establish the usage of PRoW, in the area of the Proposed Scheme. The surveys included:
- all roads and associated footways intersected by the proposed line of the route;
  - green corridors including footpaths, cycleways, bridleways, river and canal paths; and
  - PRoW surveys were carried out in August and September between 08:00 and 18:00 on a weekend to capture leisure users, to reflect the peak movement demands along these routes. The September surveys were also undertaken between 08:00 and 18:00 on a weekday to capture school and commuting users. All PRoW which may be intersected by the Proposed Scheme were surveyed.
- 5.7.14 Pedestrian flow surveys at junctions were undertaken in parallel with MCC surveys.

### *Station surveys*

- 5.7.15 Pedestrian surveys were carried out at Northolt station during a weekday morning peak period of 08:00 to 09:00.

### **Highway network**

- 5.7.16 The following section describes the roads that would be affected by the Proposed Scheme, either at the construction or operational stage. The proposed vent shaft sites are well connected to the strategic road network, lying generally parallel to the A40 which provides onward connections via the M40, M25, M4 and M1.

### *Strategic road network*

#### **Motorway network**

- 5.7.17 The M40/M25 junction is located approximately 10km to the west of the Northolt Corridor community forum area. Junction 1 of the M1 at Hendon, is located 6.5km to the north and east of the Hanger Lane gyratory while junction 1 of the M4 at Chiswick is located some 4.5km to the south.

#### **'A' roads**

- 5.7.18 Proposed construction works within CFA5 are generally located parallel to and to the north of the A40 Western Avenue. The A40 is on the TLRN. It commences from Westminster in Central London and becomes the M40 to the west, connecting to the M25 and other destinations to the north. Below is a brief description of each site location in relation to the SRN.

### *West Gate*

- 5.7.19 The Hanger Lane Gyratory is the junction between the Western Avenue (A40), North Circular Road (A406) and Hanger Lane (A4005). The Western Avenue is grade separated, passing under the gyratory junction. The Western Avenue (A40) and the Northern Circular Road (A406) form part of the SRN.

### *Greenpark Way*

- 5.7.20 The Greenpark Way compound is connected to the A4127 Greenford Road to the west via Greenpark Way to the north of the site and Rockware Avenue to the south of the site. Greenford Road connects to the Western Avenue (A40) to the south.

### *Mandeville Road*

- 5.7.21 The Mandeville Road (A312) site compound site is located directly off Mandeville Road to the north east of the existing railway over-bridge. Mandeville Road connects to the Western Avenue (A40) to the south.

## *Local road network*

### **West Gate**

- 5.7.22 West Gate is a single carriageway bidirectional road to the immediate north of the Hanger Lane gyratory (A4005). It is accessed from Hanger Lane and connects the commercial West Gate Business Park area with the A40, A406 and A4005. West Gate junction with Hanger Lane is a signalised junction with a banned right turn from Hanger Lane into West Gate.
- 5.7.23 Access to Western Avenue via the West Gate underbridge to the south is restricted to vehicles under 11'-6" and is single lane one way working southbound with a northbound cycle contraflow.

### **Greenpark Way**

- 5.7.24 Greenford Road is a main borough distributor road, commencing from the Uxbridge Road approximately 4km south of the site and carries traffic in a north/south direction to the A4005 Harrow Road approximately 2.5km to the north of the site.

### **Mandeville Road**

- 5.7.25 Access to the Mandeville Road (A312) site compound is via a private road which lies between a residential block and a pedestrian access leading to Northolt station. Mandeville Road is a subject to a 30 mph speed limit. A northbound bus lane commences immediately north of the junction with Eastcote Lane North and continues over the railway bridge to terminate approximately 80m in advance of the Mandeville Road junction with Eastcote Lane.



- 5.7.26 Eastcote Lane North is located just to the north of the worksite site. It is subject to a 30mph speed limit. Badminton Close is adjacent to the worksite site. Badminton Close is a residential cul-de-sac with on street parking.

### *Baseline conditions*

- 5.7.27 This section examines baseline traffic flows on the strategic and local highway network.

Table 5-73: Northolt Corridor 2012 baseline flows

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
Coronation Road	EB	239	14	135	12
	WB	51	10	80	10
Connell Crescent bridge	EB	347	7	129	3
	WB	15	0	79	0
Hanger Lane East Bridge	SB	5,129	299	4,749	146
Hanger Lane West Bridge	NB	4,617	249	4,778	142
Alpertown Lane	NB	496	1	369	1
	SB	347	37	287	1
Bideford Avenue	NB	354	10	240	7
	SB	439	27	692	24
Horsenden Lane	NB	246	8	321	14
	SB	260	23	304	8
Greenford Road (north of Uneeda Drive)	NB	417	15	550	2
	SB	554	8	496	2
Greenford Road (south of Uneeda Drive)	NB	834	84	999	36
	SB	862	66	955	40
Oldfield Lane (north of Uneeda Drive)	NB	317	19	631	17
	SB	676	24	482	13
Mandeville Road (north of Eastcote Lane)	NB	1253	42	1,222	26
	SB	838	44	818	21
Mandeville Road (south of Eastcote Lane)	NB	1,131	58	1,500	32
	SB	1,012	60	503	33
Eastcote Lane	EB	659	13	669	9

	WB	322	12	489	10
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- 5.7.28 The operation of the key junctions which form the main access routes from the strategic network to the study area sites have been analysed for the 2012 existing conditions and the results are summarised below.

### **Friary Road / Friary Road**

- 5.7.29 This junction is a small three-arm non-signalised intersection. The eastern arm is a one-way road, the western and southern arms operate as two-way roads. A segregated contra-flow cycle lane is provided on the eastern arm of the junction. There are no bus stops located in the close proximity to the junction. Bus route 260 runs in the east-west direction across the junction.
- 5.7.30 Table 5-74 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated WeLHAM model.

Table 5-74: 2012 baseline performance at junction A40 Western Avenue/Wales Farm Road/Leamington Park

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Friary Road (EB)	145	11	0
Friary Road (NB)	160	20	0
Friary Road (WB)	122	6	0
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Friary Road (EB)	64	5	0
Friary Road (NB)	246	24	0
Friary Road (WB)	149	7	0

- 5.7.31 The model shows that this junction performs well within capacity in AM and PM peak hours. The junction has a low traffic flows with no congestion.

### **A406 Hanger Lane Gyratory (NW Corner)**

- 5.7.32 This junction is a large three-arm signalised interchange with no surface crossing provisions. The junction is located at the north-west corner of Hanger Lane Gyratory on the TLRN which connects the A40 Western Avenue, A406 North Circular Road and Hanger Lane. Hanger Lane north has four entry- and three exit-lanes. There are bus stops located on the southern arm of the gyratory with bus routes 83, 95, 112, 226 and 487 running through the junction.
- 5.7.33 Table 5-75 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated WeLHAM model.



Table 5-75: 2012 baseline performance at junction Hanger Lane Gyratory (NW Corner) (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Hanger Lane	1,366	89	19
Roundabout (NB)	4,866	53	17
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Hanger Lane	1,251	75	18
Roundabout (NB)	4,921	55	19

- 5.7.34 The model shows that this junction operates at and within capacity in AM and PM peak hours respectively. The Gyratory performs well despite the substantial traffic flow. Hanger Lane performs close to its capacity but with a slightly better performance in the PM peak hour. However, there is a high queue accumulation on both approach arms in both modelled periods.

### Hanger Lane/West Gate

- 5.7.35 This junction is a three-arm signalised intersection adjacent to the Hanger Lane Gyratory. The A4005 Hanger Lane provides the northern and southern arms, with West Gate as the western arm. West Gate is a two-way road with a single lane in each direction, widening to two lanes, one for right-turn movements and one for left-turn movements, on the approach to the junction. There is also an ASL on the left-turn lane of the West Gate approach and a dedicated signalled cycle crossing facility across the northern arm of Hanger Lane. Two refuge islands in West Gate facilitate pedestrian crossing movements across the arm of the junction. Vehicles can only turn left into West Gate, from the southern arm of the A4005 Hanger Lane. There are three lanes on both southern and northern approach arms of Hanger Lane. Bus routes 83 and 487 travel along Hanger Lane through the junction.
- 5.7.36 Table 5-76 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated WeLHAM model.

Table 5-76: 2012 baseline performance at junction Hanger Lane/West Gate (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Hanger Lane (SB)	1,346	43	5
Hanger Lane (NB)	961	36	3
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Hanger Lane (SB)	1,232	38	6
Hanger Lane (NB)	1,106	39	5

- 5.7.37 The model shows that the junction operates well within its capacity during both modelled periods. The performance of the gyratory is good considering the high volume of traffic passing through it.

### **Ealing Road/Hanger lane/Alperton Lane/Riverside Gardens**

- 5.7.38 This junction is a four-arm non-signalised intersection. A4005 Ealing Road forms the northern arm, Riverside Gardens the eastern arm, A4005 Hanger Lane the southern arm and Alperton Lane being the western arm. There is a zebra pedestrian crossing on Ealing Road. There is petrol station on the southwest side of the junction with access to and from Hanger Lane and Alperton Lane. Bus stops are located on Ealing Road and Hanger Lane adjacent to the junction. Bus routes 83 and 487 passes through the junction along Ealing Road and Hanger Lane.

Table 5-77: 2012 baseline performance at junction Ealing Road/Hanger lane/Alperton Lane/Riverside Gardens

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Ealing Road	1,113	30	0
Hanger Lane	961	48	0
Alperton Lane	367	36	1
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Ealing Road	880	29	0
Hanger Lane	1,106	56	0
Alperton Lane	272	29	3

- 5.7.39 The model shows that this junction performs well within capacity in AM and PM peak hours. No queue accumulation is observed at the junction. Ealing Road and Hanger Lane have much higher traffic flows than Alperton Lane.

### **Greenford Road/Roundabout (Western Avenue) (north entry)**

- 5.7.40 The intersection of A4127 Greenford Road and A40 Western Avenue consists of a large signalised roundabout beneath the A40 flyover. Greenford Road is two-way and runs in a north-south direction and the A40 is two-way and runs in an the east-west direction. Greenford Road has three approach lanes and two exit lanes. Pedestrian crossing movements are via subways at this junction. Bus routes 105, E6, 92 and 95 run through the junction.
- 5.7.41 Table 5-78 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated WeLHAM model.

Table 5-78: 2012 baseline performance at junction Greenford Road/Roundabout (Western Avenue) (north entry) (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Greenford Road	929	15	0
Roundabout (EB)	918	23	0
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Greenford Road	996	16	0
Roundabout (EB)	1,036	25	0

- 5.7.42 The model shows that this junction operates well within capacity in AM and PM peak hours. No queues are observed at the junction. Greenford Road and the Roundabout arms have similar traffic volumes.

### Greenford Road/Rockware Avenue

- 5.7.43 This junction is a three-arm signalised intersection with controlled pedestrian crossing facilities on all the arms. ASLs are present on all arms. Greenford Road has one exit and two entry lanes. Rockware Avenue is a two-way road which provides access to an industrial area. There is a large capacity car parking serving a retail area to the north-east of the junction. Bus routes 395 and 92 use the junction travelling along A4127 Greenford Road.
- 5.7.44 Table 5-79 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated WeLHAM model.

Table 5-79: 2012 baseline performance at junction Greenford Road/Rockware Avenue (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Greenford Road (SB)	540	66	6
Greenford Road (NB)	918	91	12
Rockware Avenue	77	64	7
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Greenford Road (SB)	486	78	6
Greenford Road (NB)	1,036	105	13
Rockware Avenue	150	73	8

- 5.7.45 The model shows that this junction performs close to capacity in AM peak hour and over its capacity in the PM peak hour. There is a low traffic flow on Rockware Avenue. The southern arm of Greenford Road, having a greater traffic flow, is the main contributor to the poor performance of the junction in both peak hours. The queue levels are similar in AM and PM peaks.

### Church Road/Target Roundabout (northern arm)

- 5.7.46 The A312 Church Road joins the A40 via slip roads at Target Roundabout, the main A40 Western Avenue passes beneath the roundabout in an underpass. Church Road joins the roundabout from the north-east and from the south-west. The north-eastern arm of the roundabout is a three-arm signalised intersection. Church Road is a two-way road with two approach and two exit lanes. The traffic flow circulation around the roundabout is clock-wise. There are three lanes on the roundabout. No pedestrian crossing facilities are provided at this junction. Bus routes 90, 120, 140 and 282 run through the junction along Church Road.
- 5.7.47 Table 5-80 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated WeLHAM model.

Table 5-80: 2012 baseline performance at junction Church Road/Target Roundabout (northern arm) (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Church Road	1,072	26	0
Target Roundabout (EB)	1,189	29	0
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Church Road	535	13	0
Target Roundabout (EB)	1,532	37	0

- 5.7.48 The model shows that this junction operates well within capacity in AM and PM peak hours. No queue is observed at the junction. Greenford Road and Roundabout arms have similar volume of traffic flow.

### Mandeville Road/Eastcote Lane North

- 5.7.49 This junction is a three-arm signalised intersection with signalised pedestrian crossing facilities and refuge islands on the Eastcote Lane North and northern Mandeville road arms of the junction. Mandeville Road is a two-way road with two lanes in each direction. There is a bus lane on the eastern approach arm of Mandeville Road which ends at the junction. Eastcote Lane has two approach lanes and one exit lane. Northolt Station serving London Underground is close to the junction to the south. Bus routes 140, 282 and 395 run through the junction where 140 and 395 travels along Mandeville Road and route 282 uses Eastcote Lane North and the southern arm of Mandeville Road.
- 5.7.50 Table 5-81 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated WeLHAM model.

Table 5-81: 2012 baseline performance at junction Mandeville Road/Eastcote Lane North (signals)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Mandeville Road (SB)	882	91	9
Mandeville Road (NB)	1,220	96	15
Eastcote Lane North	554	101	12
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Mandeville Road (SB)	839	76	7
Mandeville Road (NB)	1,529	104	15
Eastcote Lane North	425	96	9

- 5.7.51 The model shows that this junction operates beyond its capacity in AM and PM peak hours. All arms of the junction present a poor performance. Mandeville Road, especially its southern arm, has much higher flow than that on Eastcote Lane North.

### Pett's Hill/Wood End Lane/Mandeville Road

- 5.7.52 This junction is a non-signalised three-arm intersection with zebra crossing on Pett's Hill which is the northern arm. Mandeville Road is the southern arm with Wood End Lane being the eastern arm. All three-arms are two-way roads. There is a bus lane and a bus stop on the exit side of Pett's Hill. Bus route 140 runs through the junction along Pett's Hill and Mandeville Road.
- 5.7.53 Table 5-82 below shows the existing operation of the junction in the weekday AM and PM peak hours. Results have been extracted from the validated WeLHAM model.

Table 5-82: 2012 baseline performance at junction Pett's Hill/Wood End Lane / Mandeville Road

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Pett's Hill	354	17	0
Wood End Lane	346	34	0
Mandeville Road	766	42	0
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Pett's Hill	367	18	0
Wood End Lane	386	37	0
Mandeville Road	813	43	0

- 5.7.54 The model shows that this junction performs well within capacity in AM and PM peak hours. No congestion is observed at the junction.

## Accidents and safety

5.7.55 Accident data covering a 36-month period to the end of March 2012 was obtained from TfL and the analysed information is presented below.

### West Gate Shaft

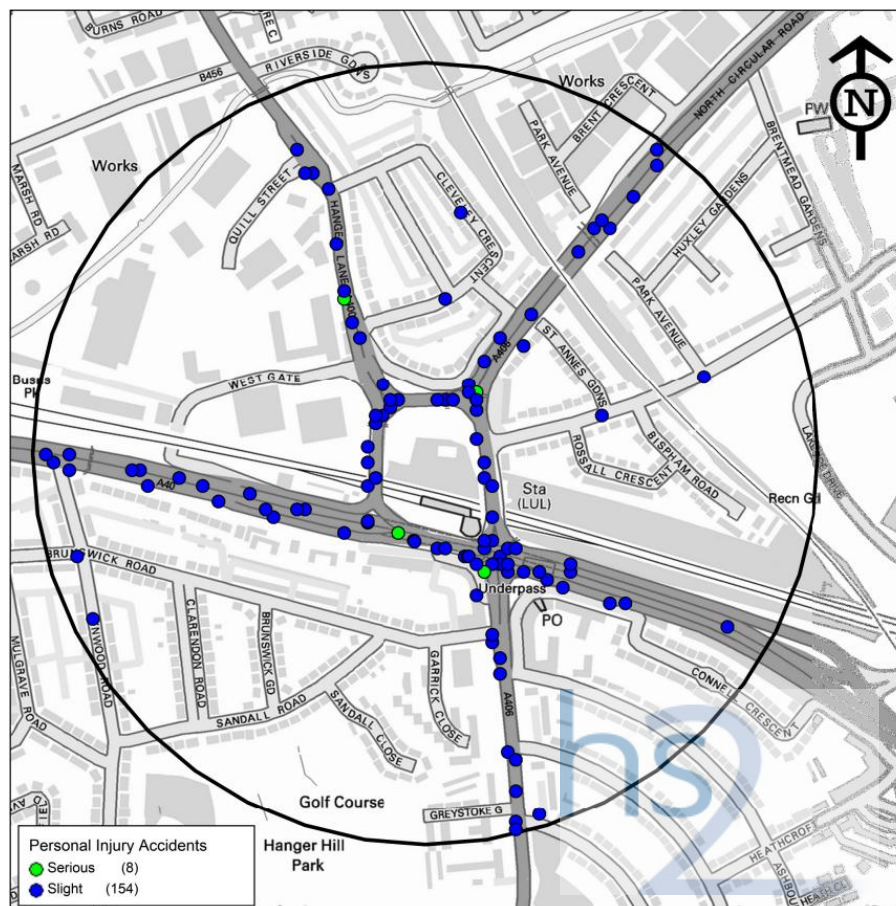
5.7.56 A total of 162 PIA occurred over the three year period in the West Gate Shaft study area, an average of 54 per year. The locations of the accidents are shown on Figure 5-43.

5.7.57 Of the 162 accidents, 95% were classified as slight and 5% involved a serious injury, with no fatal accidents. The highest number of accidents at the main gyratory intersections and particularly at the south-eastern junction (A406) with the A40 (to the south of the Hanger Lane East Bridge). Only a small number have occurred on neighbouring residential roads. Table 5-83 below summarises the accidents within the West Gate core study area.

Table 5-83: Accident Records (West Gate)

Area	Fatal	Serious	Slight	Total Accidents
CFA5 – West Gate	0	8	154	162
Mean PIA per annum	-	2.7	51.3	54

Figure 5-43: West Gate area, all accidents (number, location and severity)

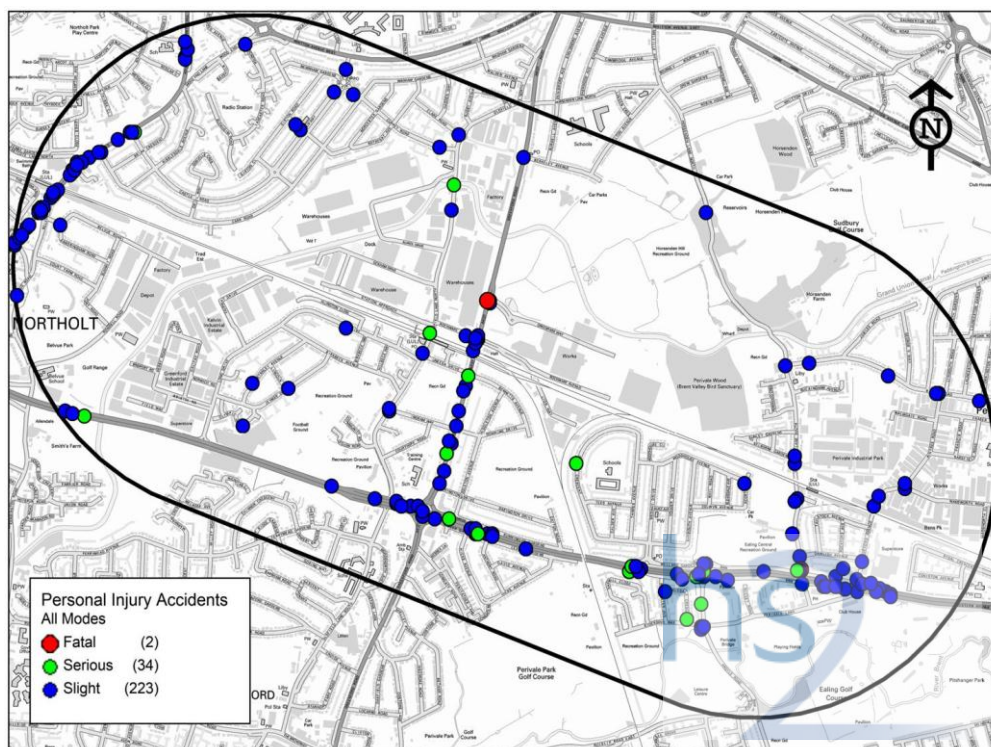




### Greenpark Way

- 5.7.58 A total of 259 PIA occurred over the three year period in the Greenpark Way Shaft study area, an average of 86 per year. The location and severity of the accidents are shown on Figure 5-44.

Figure 5-44: Greenpark Way area, all accidents (number, location and severity)



- 5.7.59 Of the 259 accidents, 86% were classified as slight, 13% involved a serious injury and 1% was fatal. The highest number of accidents occurred on the A40 and along Greenford Road south of the railway bridge. Table 5-84 below summarises accidents within the Greenpark Way core study area.

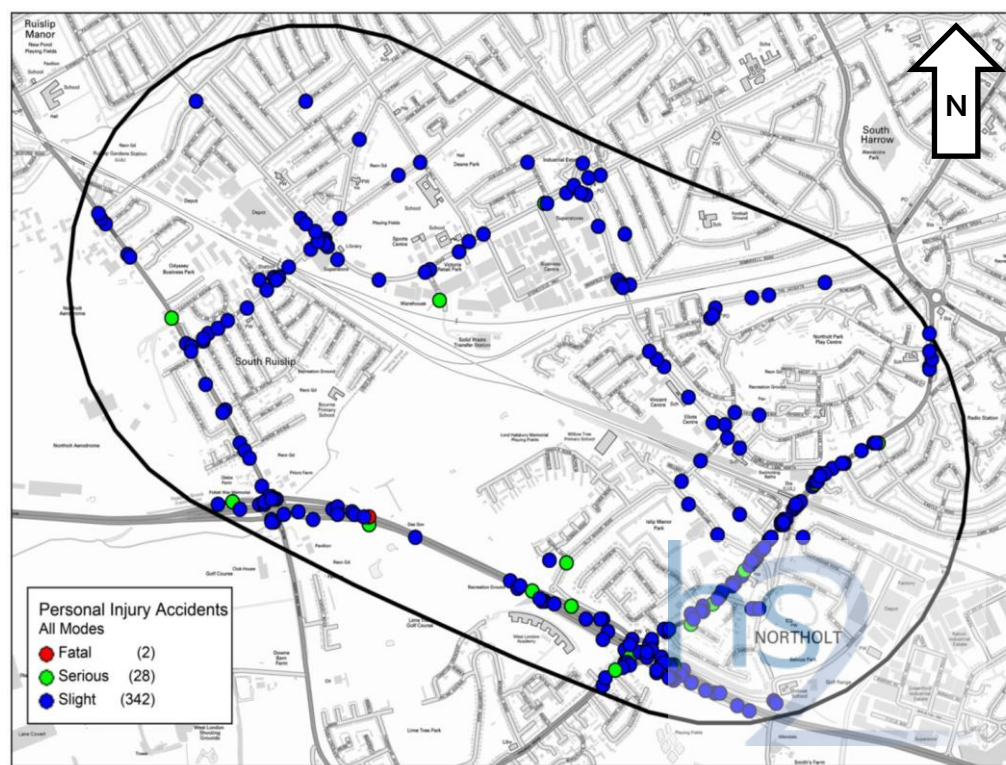
Table 5-84: Accident records (Greenpark Way)

Area	Fatal	Serious	Slight	Total Accidents
CFA5 – Greenpark Way	2	34	223	259
Mean PIA per annum	0.7	11.3	74.3	86.3

### Mandeville Road

- 5.7.60 A total of 374 PIA occurred over the three year period in the Mandeville Road Shaft study area, an average of 124 per year. The locations of the accidents are shown on Figure 5-45 below.

Figure 5-45: Mandeville Road area, all accidents (number, location and severity)



5.7.61 Of the 374 accidents, 92% were classified as slight, 7.5% involved a serious injury and less than 1% was fatal accidents. The highest number of accidents occurred on Mandeville Road, with the majority of the remaining accidents in the area occurring to along the A40 western Avenue and station approach. Table 5-85 below summarises the accidents within the Mandeville Way core study area.

Table 5-85: Accident records (Mandeville Road)

Area	Fatal	Serious	Slight	Total Accidents
CFA4 – Mandeville Road	2	28	342	372
Mean PIA per annum	0.7	9.3	114	124

## Parking and loading

### Parking controls

#### West Gate

5.7.62 West Gate has a 'no waiting at any time' double yellow line restriction on both sides of the carriageway extending for 50m from its junction with Hanger Lane. Immediately after the 'no waiting at any time' restrictions on the southern side, there is an unrestricted section of kerb sufficient for a single car and following this are two car club bays. There are a series of intermittent unrestricted and 'no waiting at any time' sections up to the West Gate underbridge.

5.7.63 On the northern side, a single yellow line restriction of no waiting 07:00 to 19:00 extends from the double yellow lines to the entrance of Kantar Media Offices. Beyond here, there are no waiting at any time restrictions to the West Gate underbridge.

5.7.64 A40 Western Avenue and A406 Hanger Lane are part of the TLRN. Hanger Lane Gyratory has double red lines ('no stopping at any time') for its full circumference and on all approach roads, for approximately 50m.

### **Greenpark Way**

5.7.65 Rockware Avenue has double yellow lines 'no waiting at any time' restrictions.

5.7.66 Links 21, 22 (Rockware Avenue) and 23 Lyon Way are closest to the proposed site compound. Greenford Road has resident permit parking on the eastern side, south of the bridge. The restriction is Permit Holders Zone Q only, Monday – Friday 10:00–11:00 and 14:00–15:00.

### **Mandeville Road**

5.7.67 The majority of the length of Mandeville Road (A312) is subject to 'no waiting at any time' restrictions (double yellow lines).

5.7.68 There is very limited on street parking on Badminton Close, located to the north of the Mandeville Road (A312) overbridge.

### *Parking surveys*

#### **Greenpark Way**

5.7.69 Figure 5-46 below shows the area covered by and summarises the results of the parking survey.

5.7.70 Links 21, 22 and 23 are closest to the proposed site compound. Links 21 and 22. No vehicles were recorded parked on Link 23 Lyon Way during the survey.

5.7.71 The survey indicates that there is spare parking capacity on link 19 Greenford Road and link 20 Rockware Avenue during weekdays and weekends.

#### **Mandeville Road**

5.7.72 Figure 5-47 below shows the area covered by and summarises the results of a parking survey.

5.7.73 Although the survey results indicate that there is spare parking capacity on Mandeville Road (A312) in the vicinity of the proposed site access/egress points, there are 'no parking at any time' restrictions in place and consequently there is no spare capacity on this section of road.



Figure 5-46: Greenpark Way parking survey location plan

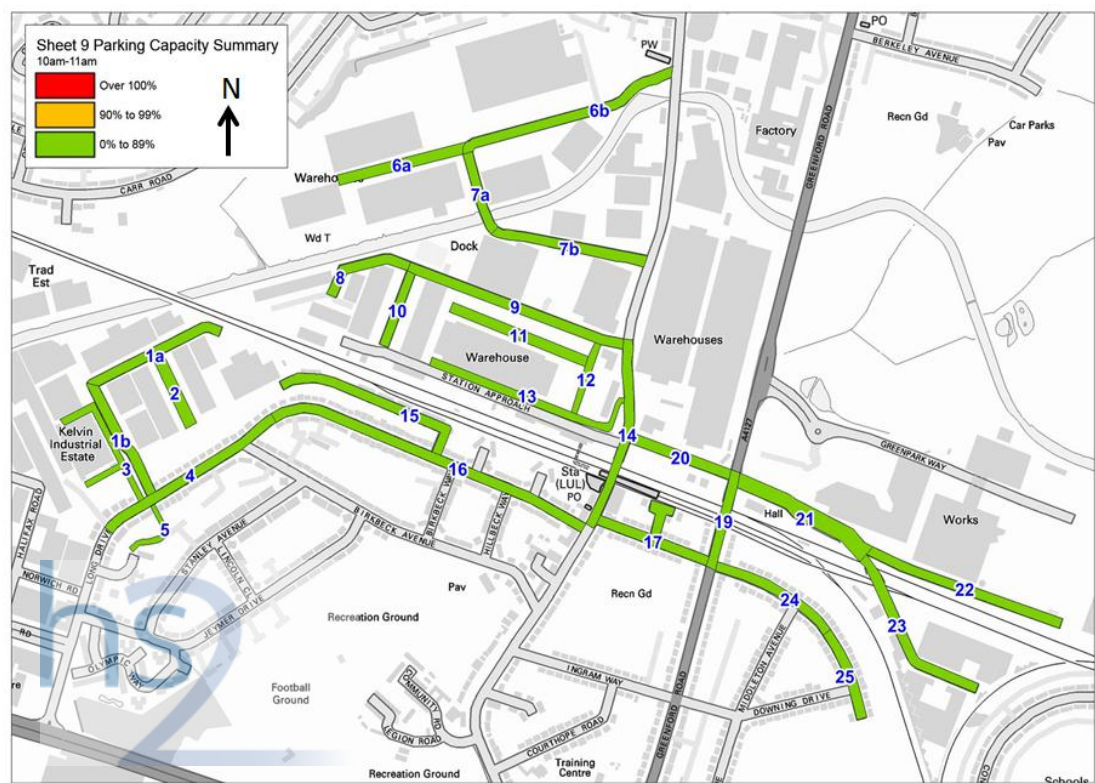
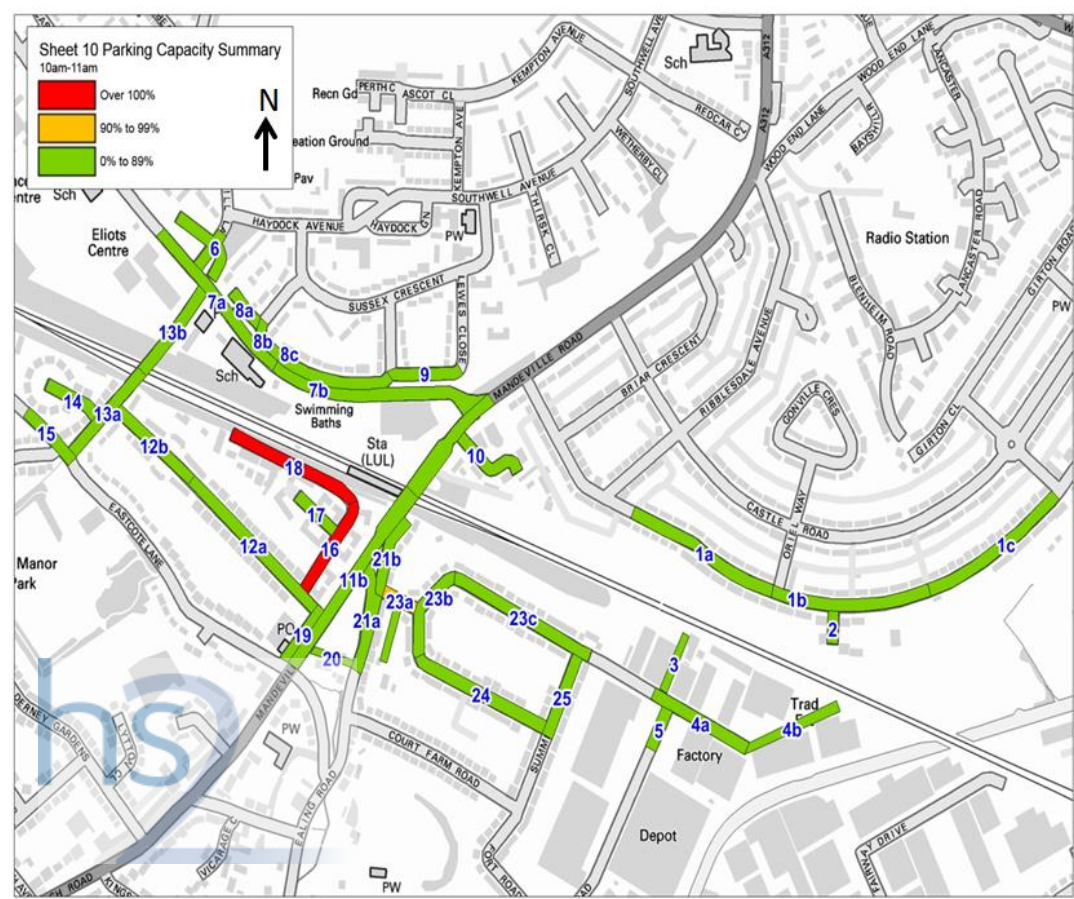


Figure 5-47: Mandeville Road parking survey location plan



## Public transport

- 5.7.74 The Northolt Corridor study area is well served by public transport, with numerous rail, LU, National Rail, bus and coach connections. The following sections describe the rail, bus and coach services in the area.

### *Rail network*

- 5.7.75 Northolt Corridor area is well served by both National Rail and LU stations.

#### **West Gate**

- 5.7.76 Hanger Lane underground station is located in the centre of the Hanger Lane gyratory roundabout and is accessed directly from the eastern bridge. The station is on the West Ruislip branch of the Central Line and is in Travelcard Zone 3.

#### **Greenpark Way**

- 5.7.77 Greenford station is accessed from Oldfield Lane North and is served by LU Central Line and national rail services. It is the terminus of the Greenford Branch Line, between Greenford and the great-western mainline which is operated by First Great Western Trains. The station is located in Travelcard Zone 4. Greenford branch trains (National Rail) run to Paddington.

#### **Mandeville Road**

- 5.7.78 The nearest station to the Mandeville Road worksite is Northolt underground station located some 55m west of the site compound access. This station typically handles some 4000 passengers in the AM peak three hours period. The station is on the West Ruislip branch of the Central Line and is in Travelcard Zone 5.
- 5.7.79 Estimated rail passenger station entry and exit flows have been derived from NR and LUL information and are summarised in Table 5-86 below.

Table 5-86: Northolt Corridor – local station entry exit counts

Station name	Station type	Estimated 3hr AM peak (07:00-10:00)	Estimated annual entries and exits (2010/11)
Hanger Lane	LUL	3,166	3,362,341
Perivale	LUL	1,959	2,080,788
Greenford	LUL+NR	3,718	4,100,516
Northolt	LUL	4,029	4,279,014

### Local bus services

5.7.80 There is a wide range of bus service provision in the local area. The local bus network serving the core study areas are shown on Figure 5-48, Figure 5-49 and Figure 5-50.

#### West Gate

5.7.81 A map of bus services in the Hanger Lane is shown in Figure 5-48 with a summary of the bus route service frequencies in the vicinity of West Gate is provided in Table 5-87.

Table 5-87: West Gate area, summary of bus service frequencies at Hanger Lane Gyratory (Bus Routes 83, 95, 112, 226 and 487 via Hanger Lane Bridges)

Service	Route	Direction of travel	Road used to approach Hanger Lane Gyratory	Hanger Lane Bridge used (east/ west)	Frequency (buses/hr)
83	Ealing Hospital - Golders Green	Towards Golders Green	North Circular Road	West	10
		Towards Ealing Hospital	Hanger Lane	East	10
95	Shepherd's Bush - Southall	Towards Southall	Western Avenue	-	6
		Towards Shepherd's Bush	Western Avenue	East and West	6
112	Brent Cross - Ealing Broadway	Towards Brent Cross	Hanger Lane	East	4
		Towards Ealing Broadway	North Circular Road	West	4
226	Ealing Broadway - Golders Green	Towards Ealing Broadway	Twyford Abbey Road	West	4
		Towards Golders Green	North Circular Road	East	6
487	South Harrow - Willesden Junction	Towards South Harrow	Western Avenue	West	4
		Towards Willesden Junction	Hanger Lane	East	4

5.7.82 This equates to around 28-30 buses per hour crossing the A40 in each direction. Table 5-88 below summarises the flow of buses per hour on each of the approach roads.



Table 5-88: West Gate Shaft site - summary of frequency of buses using Hangar Lane access roads (Bus Routes 83, 95, 112, 226 and 487)

Road used to approach Hanger Lane Gyratory	Total frequency of buses using approach road at 7:00am (buses/ hr)
North Circular Road	20
Hanger Lane	18
Western Avenue (Eastbound)	6
Western Avenue (Westbound)	10
Twyford Abbey Road	4

### Greenpark Way

5.7.83 The inbound buses E6, 105 and 92 travelling from the south leave the A40 at Greenford Flyover then travel north along Greenford Road, before turning left into Rockware Avenue to reach Greenford station. Southbound bus route 92 approaches Greenford station on Oldfield Lane North and continues southbound towards the A40.

5.7.84 A map of bus services in the Greenford area is provided in Figure 5-49, with a summary of the bus route service frequencies in the vicinity of Greenpark Way is provided in Table 5-89.

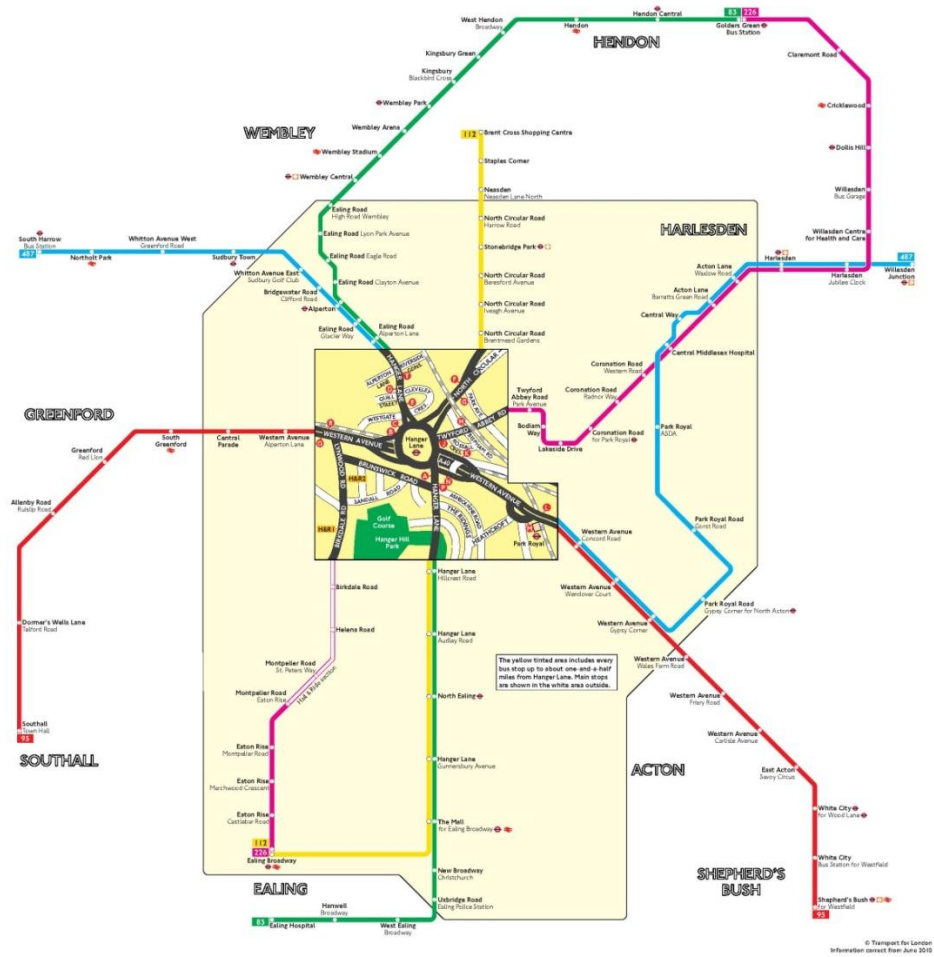
Table 5-89: Greenpark Way Bus Routes &amp; Bus Frequencies

Service	Route	Direction of travel		Weekday frequency (08:00 to 20:00) (buses/hr)
E6	Greenford Road station – Bulls Bridge Tesco	Oldfield Lane North	South	6
E6	Bulls Bridge Tesco - Greenford Road station	Greenford Road	North	6
105	Greenford Road station – Heathrow Central Bus station	Oldfield Lane North	South	6
105	Heathrow Central Bus station - Greenford Road station	Greenford Road	North	6
92	Greenford Road station – Ealing Hospital	Oldfield Lane North	South	7/8
92	Greenford Road station – Brent Park Tesco and IKEA	Greenford Road	North	7/8
395	Harrow Bus Station to Westway Cross Retail Park	Westway Cross Retail Park	South	2-3

Source: TfL Information

Figure 5-48: Bus map Hangar Lane area

Buses from Hanger Lane



**Key**

- Connections with London Underground
- Connections with London Overground
- Connections with National Rail

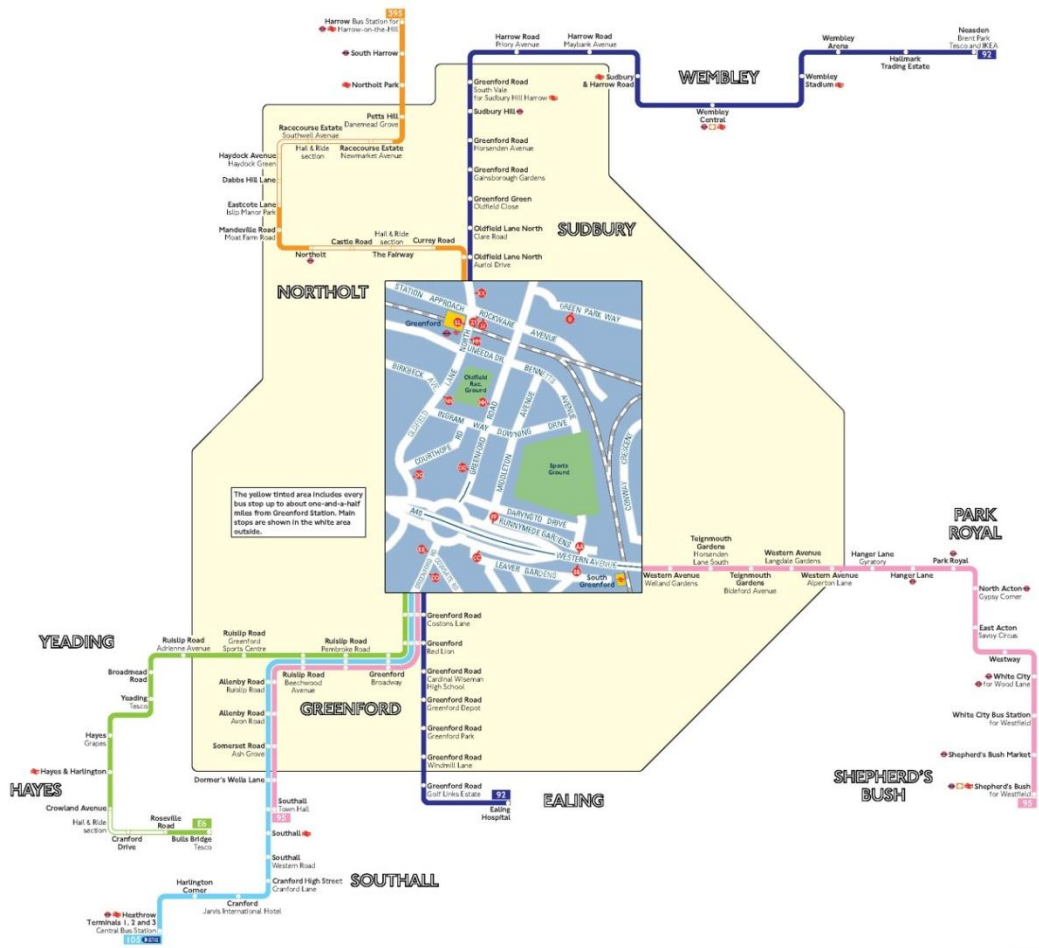
Route 226 operates as Hail & Ride on the sections of roads marked **HARE** and **HARE** on the map. Buses stop at any safe point along the road. There are no bus stops at these locations, but please indicate clearly to the driver when you wish to board or alight.

**Route finder**  
Day buses including 24-hour routes

Bus route	Towards	Bus stops
83	Ealing Hospital	1 2 3 4
95	Golders Green	5 6 7 8
112	Shepherd's Bush	9 10 11 12
112	Southall	13 14 15 16
226	Brent Cross Shopping Centre	17 18 19
226	Ealing Broadway	20 21 22
226	Ealing Broadway	23 24 25 HARE
487	Golders Green	26 27 28 HARE
487	South Harrow	29 30 31 32
487	Willersden Junction	33 34 35 36

Figure 5-49: Bus map Greenford area

Buses from Greenford Station



**Key**

- Connections with London Underground
- Connections with London Overground
- Connections with National Rail

Red discs show the bus stop you need for your chosen bus service. The disc appears on the top of the bus stop in the street (see map of town centre in centre of diagram).

**Route finder**  
Day buses including 24-hour services

Bus route	Towards	Bus stops
92	Ealing Hospital	
	Neasden	
95	Shepherd's Bush	
	Southall	
105	Heathrow Terminals 1, 2 and 3	
395	Harrow	
E6	Bulls Bridge	

## Mandeville Road

5.7.85 Six bus routes run in close proximity to Mandeville Road. These are routes 90, 120, 140, 252, 95 and N7. Figure 5-50 shows bus services in the vicinity of Mandeville Road area, with a summary of the bus route service frequencies provided in Table 5-90.

Table 5-90: Mandeville Road bus routes & bus frequencies

Service	Route	Direction of travel		Weekday frequency of Buses (08:00 to 20:00) (buses/hr)
120	Hounslow Bus station to Northolt station	Towards Northolt station	North	8-12
120	Northolt station to Hounslow Bus station	Towards Hounslow Bus station	South	8-12
140	Heathrow Bus station to Long Elmes	Toward Long Elmes	North	5-10
140	Long Elmes to Heathrow Bus station	Towards Heathrow Bus station	South	5-10
90	Northolt station to Feltham leisure west	Feltham leisure west	South	6-7
282	Ealing Hospital to Mount Vernon hospital.	Mount Vernon hospital	North	5-6
N7	Northolt station and Russell Square.	Russell Square	South	Night bus only
395	Harrow Bus Station to Westway Cross Retail Park	Westway Cross Retail Park	South	3

Source: TfL Information

### *Coach services*

5.7.86 There are no dedicated coach service facilities within Northolt Corridor study area.

### *Taxis*

5.7.87 There are no dedicated taxi facilities on the public highway in the vicinity of the main areas of assessment. However, this does not preclude the ability to pick-up / set down in these areas.

Figure 5-50: Plan of bus services in the Mandeville Road area

## Buses from Northolt Station

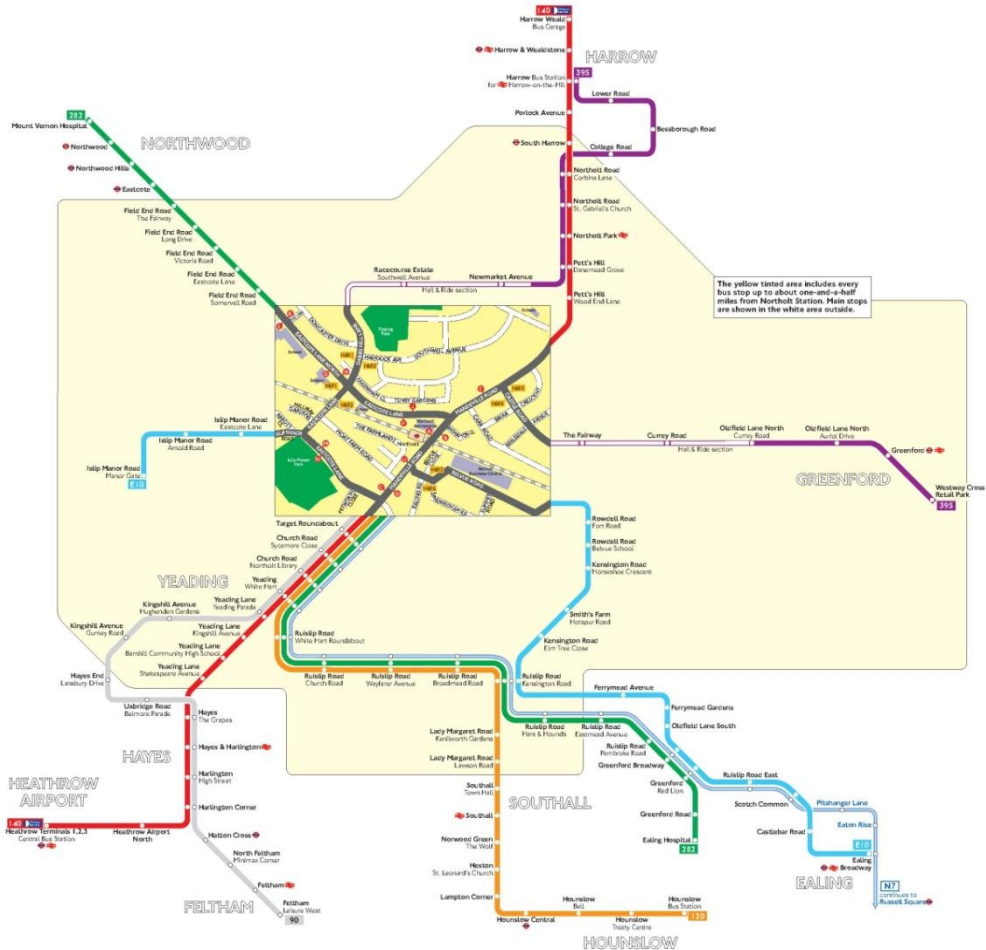
### Route finder

#### Day buses including 24-hour routes

Bus route	Towards	Bus stops
90	Feltham	B D
120	Hounslow	B D
140	Harrow Weald	A C E
282	Heathrow Terminals 1,2,3	B D H J K
395	Ealing Hospital	B D H J K
	Mount Vernon Hospital	A C E H J K
	Greenford	A C E H J K
	Harrow	B D H J K
	Ealing Broadway	A C E H J K
	Northolt Islip Manor Road	B D H J K

#### Night buses

Bus route	Towards	Bus stops
N7	Russell Square	B D



### *Public transport interchanges*

- 5.7.88 There are no major multi-modal interchanges within Northolt Corridor study area.

#### **West Gate**

- 5.7.89 Interchange with Hanger Lane underground station is obtained via bus stops located on the Hanger Lane eastern bridge (serving southbound bus services only) and also to the south of the Western Avenue (A40) junction. The stops to the south of the A40 junction are linked to the underground station by a series of pedestrian tunnels.

#### **Greenpark Way**

- 5.7.90 There are no passenger interchange facilities at this site. The closest interchange is at Greenford Station located approximately 700m west of the site.
- 5.7.91 A bus stand sufficient for 3 buses is located on the westbound carriageway of Rockware Avenue and bus stop JJ (also on the westbound side) serves Routes 92, 105, 395 and E6. Route 395 approaches stop JJ southbound on Greenford Road, turning right into Rockware Avenue. It departs the area turning right to head northbound on Oldfield Lane North. Routes E6 and 10 approach Greenford Station northbound on Greenford Road turning left into Rockware Avenue and left again to head southbound on Oldfield Lane North towards the A40.

#### **Mandeville Road**

- 5.7.92 There are three bus stops in close proximity to the Mandeville Road. Stop A is located on the western northbound side of Mandeville Road bridge, adjacent to Northolt station. Stop B is located on the immediate northern side of the bridge and serves southbound services. Stop U is located approximately 170m to the south of bus stop A and is served by the same northbound services of bus stop A.



## Pedestrians, cyclists and equestrians

- 5.7.93 The following section describes the pedestrian and cycle facilities in the Northolt Corridor study area.

### *Pedestrian facilities*

#### **West Gate**

- 5.7.94 West Gate underbridge provides a pedestrian and cycle link between West Gate and Western Avenue. West Gate has footways on both sides of the road and links directly to Hanger Lane at its eastern end. The West Gate/Hanger Lane signalised junction has provision for pedestrians travelling north/south along Hanger Lane to/from West Gate. Pedestrians and cyclists wishing to access the eastern side of Hanger Lane are required to use the subways at Hanger Lane gyratory where pedestrian tunnels link the Hanger Lane underground station with the pedestrian routes external to the gyratory.
- 5.7.95 Survey data for pedestrians and cyclists using West Gate Underbridge is provided below in Table 5-91 below.

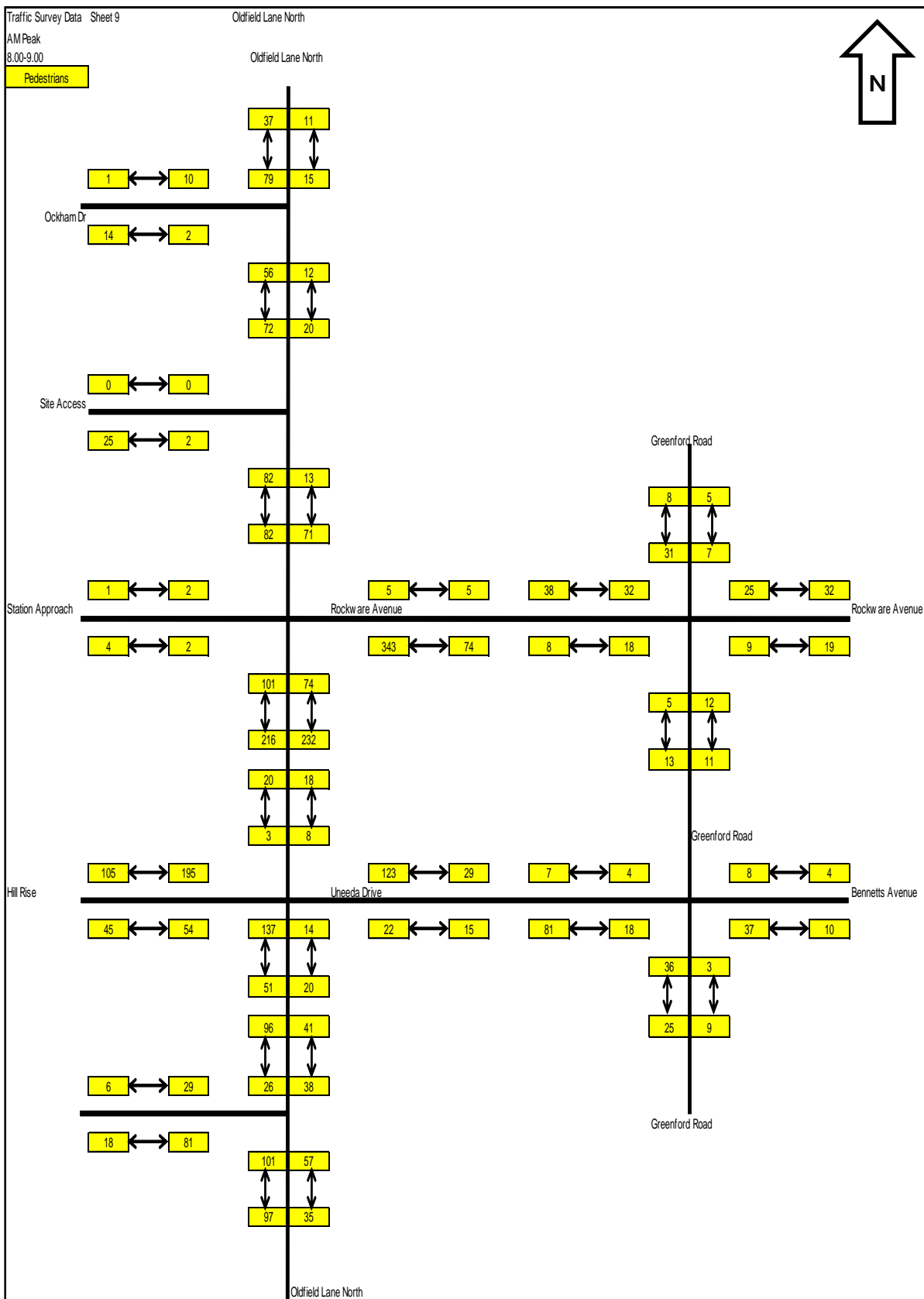
Table 5-91: West Gate pedestrian and cyclist survey summary

Movement	East to west		West to east	
	Pedestrian	Cyclist	Pedestrian	Cyclist
AM (08:00 – 09:00)	0	1	0	1
IP (Average per hour between 11:00 – 13:00)	2	3	1	1
PM (17:00 – 18:00)	0	0	0	2
Total (08:00 – 18:00)	5	11	6	11

#### **Greenpark Way**

- 5.7.96 Signalled pedestrian crossing facilities are located north of the site on each arm of Greenford Road junction with Rockware Avenue. Survey data for pedestrians in the Greenpark Way area is provided in Figure 5-51.
- 5.7.97 The busiest section is on Oldfield Lane North south of the Rockware Avenue junction.

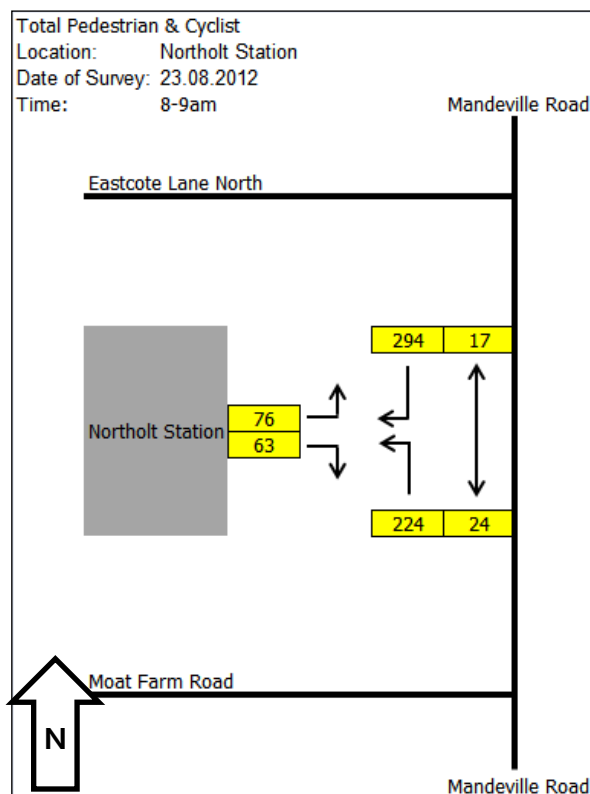
Figure 5-51: Greenpark Way - weekday AM peak pedestrian flows



## Mandeville Road

- 5.7.98 Pedestrian footways are provided to both sides of the Mandeville Road bridge over the railway. From the eastern side, Northolt station can be reached by a steep footpath that takes pedestrians underneath the bridge over the railway. The footpath is located on the southern side the rail line. A similar subway access is available from the opposite western side.
- 5.7.99 Figure 5-52 below shows the pedestrian and cycle flows past Northolt underground station together with those entering and exiting the station. The busiest section is on Mandeville Road south between the stations and Eastcote Lane North. The figures show the peak hour AM pedestrian flows derived from the data contained in the Baseline Survey Report.

Figure 5-52: Mandeville Road (A312) Overbridge – all flows in AM peak



- 5.7.100 Signalled pedestrian crossing facilities are located at the junction of Mandeville Road and Eastcote Lane North. As well as at Eastcote Lane North arm (staggered) and the northern arm of Mandeville Road.
- 5.7.101 Pelican crossings are installed in the following locations:
- Mandeville Road on southern side of the bridge approximately 70m from Northolt underground station entrance;
  - Mandeville Road south of Eastcote Lane Junction;
  - Eastcote Lane North approximately 110m west of the junction with Mandeville Road; and

- Church Road north of the junction with Alderney Gardens.

5.7.102 Raised pedestrian side-road entry treatments are located at the junctions of:

- Eastcote Lane (eastern and western arms) junction with Mandeville Road;
- Kingston Close junction with Church Road;
- Badminton Close at junction with Mandeville Road;
- Church Road (east-west section) junction with Mandeville Road; and
- Moat Farm Road junction with Mandeville Road.

### *Cycle facilities*

5.7.103 The cycle network within CFA5 is shown in Figure 5-53 and Figure 5-54.

#### **West Gate**

5.7.104 Cyclists wishing to access the eastern side of Hanger Lane are required to use the subways at Hanger Lane gyratory where pedestrian tunnels link the Hanger Lane underground station with the pedestrian routes external to the gyratory.

#### **Greenpark Way**

5.7.105 Greenford Road is not designated TfL cycle route. However, ASLs for cyclists are present on each of the four arms of Greenford Road junction with Rockware Avenue.

#### **Mandeville Road**

5.7.106 The section of Mandeville Road to the immediate north and south of Northolt station is designated as a quieter route recommended for cyclists. The section between the station and A40 Western Avenue is not a recommended or signed route but alternative quieter north-south routes are available to the east and west.

5.7.107 Cyclists are permitted to use the bus lanes installed in the following locations:

- Mandeville Road southbound from Holmwood Close to Eastcote Lane North;
- Mandeville Road northbound from 40m south of Moat Farm Road to within 75m of Eastcote Lane North, passing over the railway bridge and running past Northolt underground station; and
- Church Road southbound from Alderney Gardens to pelican crossing to north of Church Avenue.

5.7.108 There is a cycle store located in the ticket hall of Northolt underground station.

Figure 5-53: Cycle route map – West Gate and Greenpark Way (CFA5)

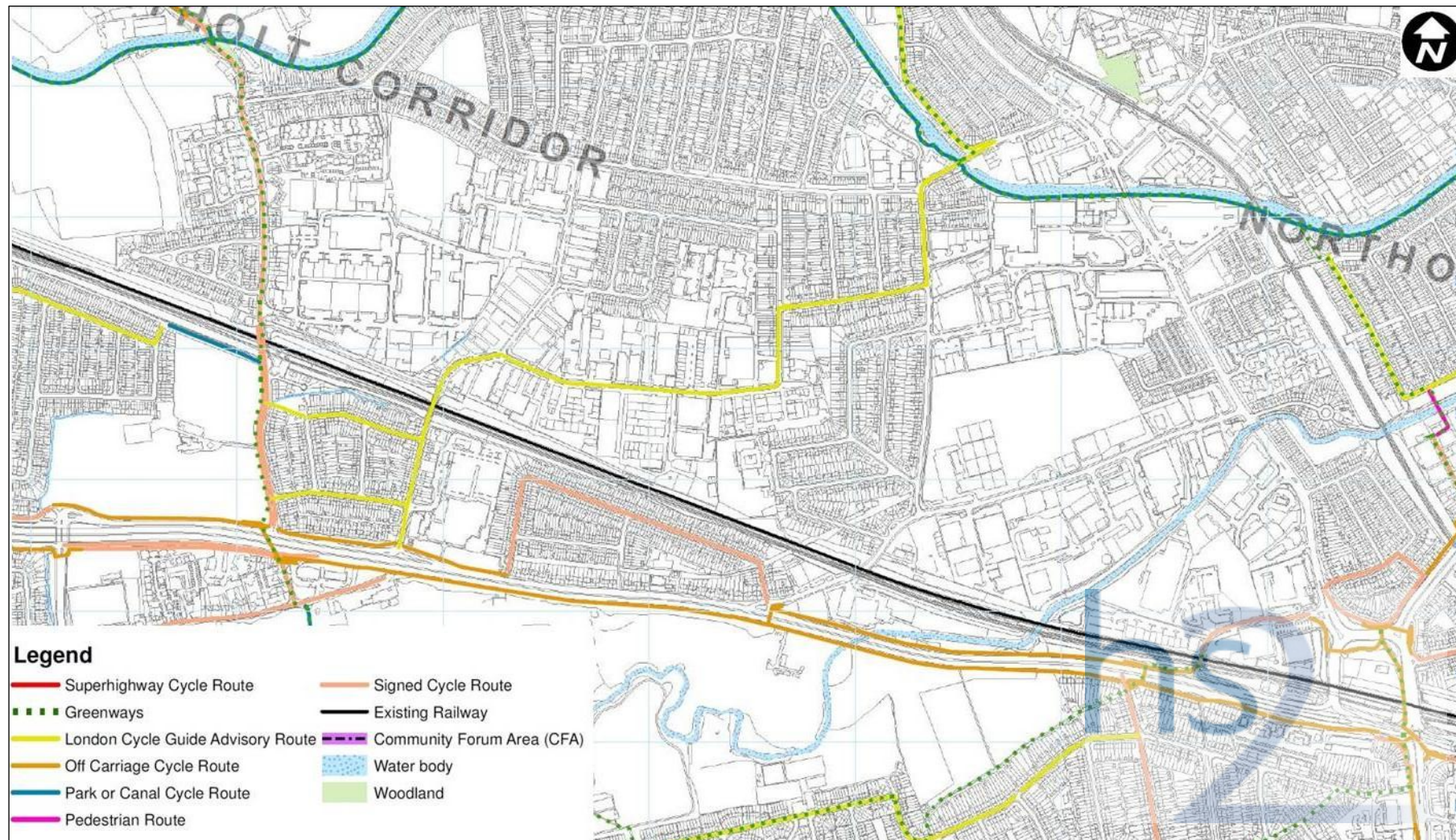
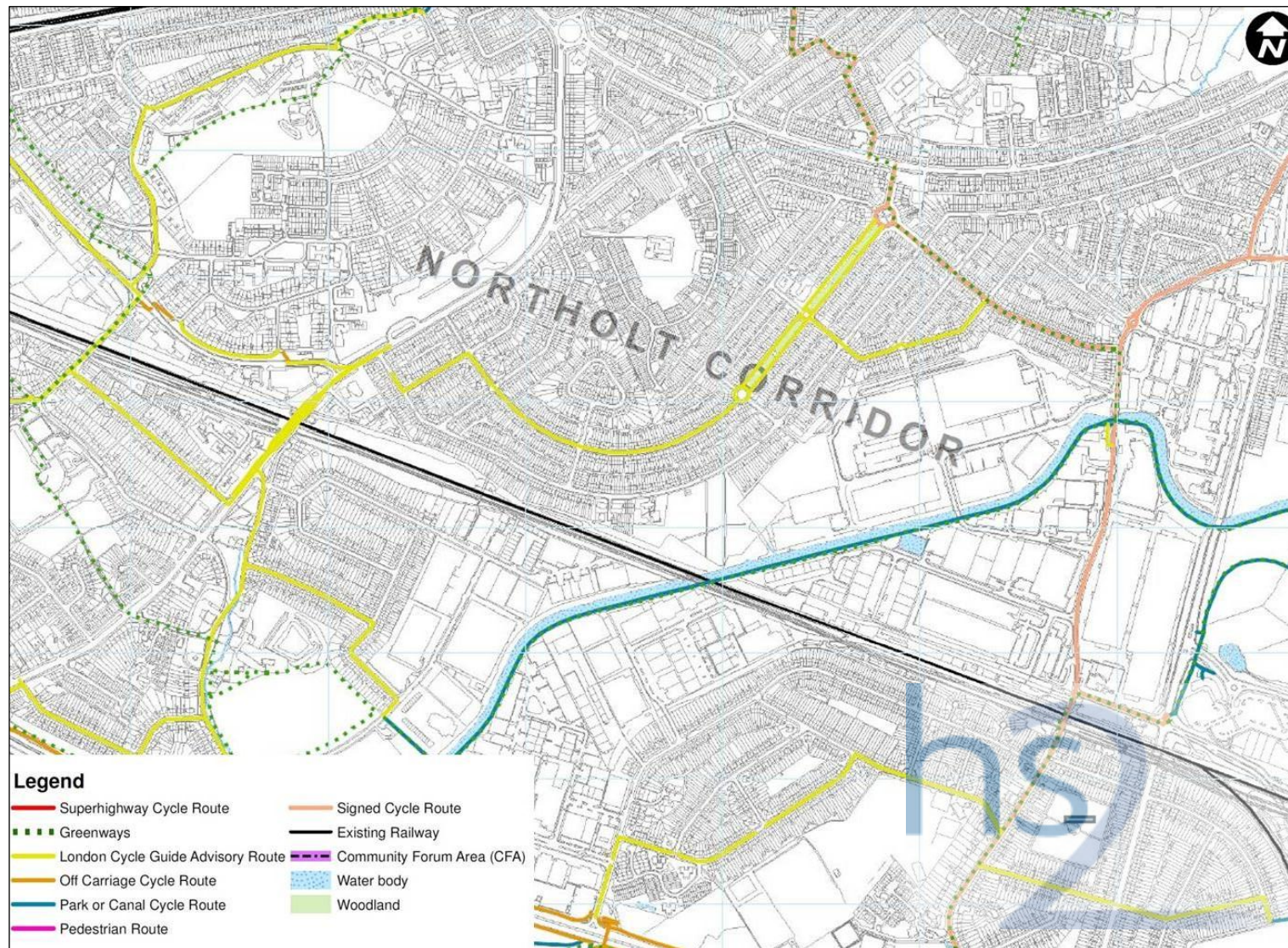




Figure 5-54: Cycle route map – Mandeville Road (CFA5)





### *Equestrian facilities*

- 5.7.109 There are no dedicated equestrian facilities in the vicinity of the Proposed Scheme in the Northolt corridor.

### **Waterways/canals**

- 5.7.110 There are no major waterways or canals in the vicinity of the core study areas within Northolt Corridor area.

### **Air transport**

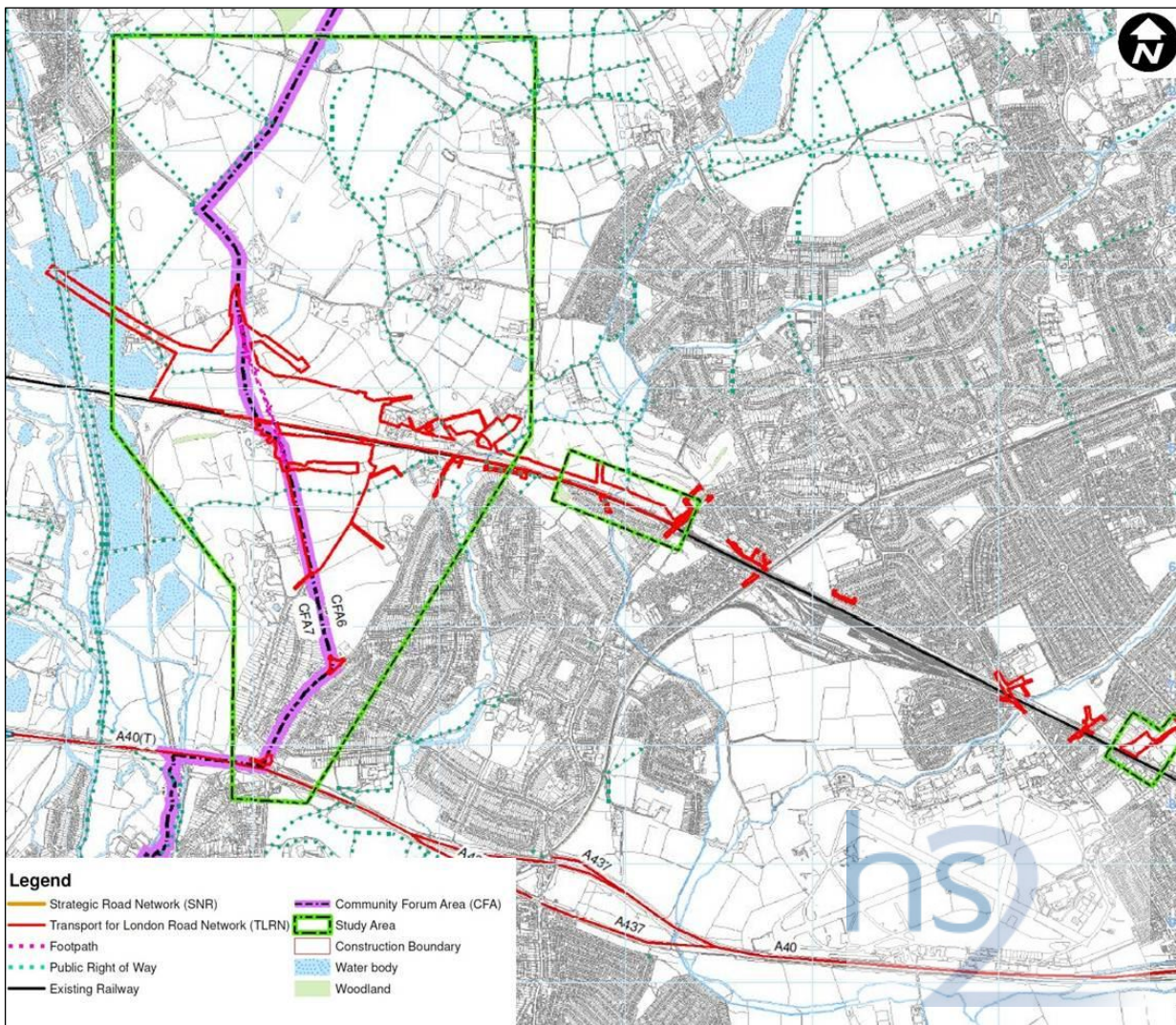
- 5.7.111 The RAF Northolt Aerodrome is located 1.5km west of the westernmost part of the Proposed Scheme within CFA5. The Proposed Scheme is not likely to impact on the operation of the aerodrome.

## 5.8 South Ruislip to Ickenham (CFA6)

### Study area

- 5.8.1 This section provides an overview of the baseline traffic and transport conditions for the section of the Proposed Scheme that passes through the South Ruislip to Ickenham CFA.
- 5.8.2 It describes the transport infrastructure within the CFA, which would be affected either by the construction or operation of the Proposed Scheme. For this area, the baseline conditions relate to the transport network affected by construction of the proposed scheme in the South Ruislip and Ickenham areas, along with the operational impacts of the proposed scheme.
- 5.8.3 The scope of work and study area has been discussed with the key transport authorities including TfL and the London Borough of Hillingdon (LBH).
- 5.8.4 The road network study area for the South Ruislip to Ickenham includes the A40 Western Avenue; the A4180 West End road; and the B466 Ickenham Road. The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFA6 Report), the core study area within the CFA boundary and the main road network can be seen in Figure 5-55 below.
- 5.8.5 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from east to west along the proposed route. In terms of describing baseline conditions within CFA6, it has been necessary to group the information into broad geographical groupings as follows:
- South Ruislip area;
  - West Ruislip area;
  - Breakspear Road South area; and
  - Harvil Road area.

Figure 5-55: South Ruislip to Ickenham study area



## Local land uses

- 5.8.6 The proposed route alignment in the South Ruislip to Ickenham area to the east of Ickenham Road passes through (beneath) mostly suburban land, uses including residential, office, retail, light industrial, warehousing and generic business trades. The area to the west of Ickenham Road is semi-rural land, uses are mostly residential, recreational (golf course), woodland and agricultural.

## South Ruislip

- 5.8.7 This site is located in the London Borough of Hillingdon and it is proposed that a tunnel vent shaft be sunk on an area of vacant land located approximately 350m to the east of South Ruislip station. The site is on the northern side of the existing LU Central Line and Chiltern Railways mainline and is situated to the rear of a disused DIY superstore.

- 5.8.8 Access to the worksite is via a service delivery access road adjacent to the disused DIY store off Victoria Road. Victoria Road is a busy mixed use (residential/commercial) road.

#### *West Ruislip*

- 5.8.9 This section is located in the London Borough of Hillingdon. The Proposed Scheme will emerge from tunnel, leading from Northolt underground station, via a portal immediately to the west of the B466 Ickenham Road. From here the line rises within a retained cutting from east to west.

- 5.8.10 The area surrounding the west portal worksite is mainly residential with small commercial premises fronting B466 Ickenham Road. To the west of Ickenham Road lies Ruislip Golf Club. West Ruislip Underground station is situated approximately 300m to the south of the works on B466 Ickenham Road.

#### *Breakspear Road South*

- 5.8.11 The area in close proximity to Breakspear Road South worksite is semi-rural surrounded by open fields, PRoW and isolated farm houses. The Schering Plough Animal Health clinic currently sits on the proposed worksite. The River Pinn is located approximately 250m to the east of the site.

- 5.8.12 There is a concentration of residential dwellings approximately 500m to the south of the worksite close to the Breakspear Road South railway bridge.

#### *Harvil Road*

- 5.8.13 Similar to the Breakspear Road South worksite, the area surrounding Harvil Road worksite is also semi-rural mainly surrounded by open fields and woodland.

- 5.8.14 There is an industrial yard to the south of the existing Chiltern rail line reached via an access road leading west off Harvil Road at a point to the immediate south of the existing railway bridge.

- 5.8.15 To the north of the worksite there is a compound currently occupied by West London Dogs Trust. A lane which runs along the northern boundary of the worksite opposite the Dogs Trust property leads to Dews Farm, Hillingdon Junior Canoe Club and Hillingdon Outdoor Activities centre.

- 5.8.16 The Colne Valley waterways are located to the west of Harvil Road.

#### *Surveys*

- 5.8.17 Transport surveys have been undertaken to obtain baseline data for the impact assessment.

- 5.8.18 A series of pedestrian flow surveys were undertaken (in period June-September 2012) to assist in determining typical usage. In addition baseline parking surveys were undertaken in summer 2012. The survey locations are shown within the Baseline Survey Report in Annex B(ii).

### *Traffic surveys*

- 5.8.19 The traffic surveys comprised of parking occupancy surveys within the vicinity of the planned construction works carried out during the summer 2012 between 10:00 and 11:00 on a weekday.

### *Non-motorised user surveys*

- 5.8.20 Non-motorised user surveys were undertaken in August 2012 to establish the usage of PRow including roads, in the area of the Proposed Scheme route. The surveys included:
- all roads and associated footways intersected by the Proposed Scheme. The pedestrian surveys on roads and at junctions were carried out in August 2012 between 08:00 and 18:00 on a weekend; and
  - green corridors including footpaths, cycleways, bridleways, river and canal paths. PRow surveys were carried out in August between 08:00 and 18:00 hours on a weekend to capture leisure users, to reflect the peak movement demands along these routes. All PRows which may be intersected by the Proposed Scheme were surveyed.
- 5.8.21 In addition to recording the level of usage of the routes, a number of users were asked to participate in completing a questionnaire. The questionnaire was designed to build on the pedestrian survey capturing information on the whole journey origins and destinations were recorded.

### **Highway network**

- 5.8.22 The following section describes the roads that would be affected by the Proposed Scheme, either at the construction stage or when operational.

### *Strategic road network*

#### **Motorway network**

- 5.8.23 The M40 is a dual three lane motorway which is a western extension to the A40 Western Avenue, forming an east-west route approximately 1km to the south of the Breakspear Road South and Harvil Road sites.
- 5.8.24 Junction 1 of the M40 is a grade separated six-arm roundabout (Denham Roundabout) approximately 2km to the southwest of the Breakspear Road South/Harvil Road sites, which provides access to the A40 Western Avenue, the A40/A4020 Oxford Road, the A412 Denham Road and Denham Court Drive.
- 5.8.25 Junction 1a of the M40 is a grade separated junction with junction 16 of the M25 which is located approximately 3km to the south west of the Breakspear Road South/Harvil Road sites. Junction 1 of the M1 at Hendon is located approximately 16km to the east and junction 1 of the M4 at Chiswick is located some 15km to the south east.



## **'A' roads**

- 5.8.26 South Ruislip to Ickenham CFA lies parallel to and to the north of the A40 Western Avenue. The A40 is a part of the TLRN. It commences in Westminster, in Central London and becomes the M40 to the west, connecting to the M25 and other destinations to the north.

### *South Ruislip*

- 5.8.27 The vent shaft is approximately 2.5km west of the East Portal site and is approximately 1km north of the A40 Western Avenue.

### *West Ruislip*

- 5.8.28 The A40 Western Avenue is approximately 1.8km to the south of the proposed West Portal worksite.

### *Breakspear Road South and Harvil Road*

- 5.8.29 The A40 Western Avenue junction with the B467 Swakeleys Road is a grade separated roundabout (Swakeleys Roundabout) approximately 2km to the south of the proposed Breakspear Road South/Harvil Road worksites. This provides connections to the M40 which is another 1.3km to the west along the A40 and to the M25 which is a further 2km west along the M40.

## **Local road network**

### **South Ruislip**

- 5.8.30 The South Ruislip Vent Shaft is located on the north eastern side of the existing LU Central Line and Chiltern Railways mainline and is situated to the rear of a disused DIY superstore.
- 5.8.31 The disused DIY superstore fronts onto Victoria Road between its junctions with Bridgewater Road and Long Drive. Access to the site compound is from Victoria Road via the existing superstore goods delivery access road, which is located on the southeast side of the disused DIY store.
- 5.8.32 Victoria Road is a single carriageway two-way road, on a northwest to southeast alignment, with a bus route and accommodates parking on both sides of the road.
- 5.8.33 The four-arm junction of Long Drive and Victoria Road is approximately 330m to the southeast of the site access. It is a major signalised intersection with dedicated left turn lanes and pedestrian facilities.
- 5.8.34 Long Drive runs on a northeast-southwest alignment and serves South Ruislip LU/rail station. Immediately southwest of the railway bridge, Long Drive becomes Station Approach which connects with A4180 West End Road. 650m southeast of Station Approach, the A4180 West End Road meets the A40 Western Avenue at the 'Polish War Memorial' grade separated roundabout junction.



## **West Ruislip**

- 5.8.35 The western portal site is located adjacent to the B466, Ickenham Road. Ickenham Road is a generally single carriageway, two-way road that runs on a northeast-southwest alignment. To the northeast it connects with A4180 West End Road; and to the southwest it becomes Long Lane which connects with A40 Western Avenue.
- 5.8.36 B466 Ickenham Road rises via a dual carriageway bridge spanning over the LU and Overground rail lines and is in close proximity to the south-eastern boundary of the worksite. West Ruislip LU Station is located on the south-eastern side of the B466 with its entrance on the crest of the bridge over the railway.
- 5.8.37 The primary site access is from Hill Lane to the northeast of the worksite. Hill Lane is a relatively narrow vehicular no through road, providing access to Ruislip Golf Club and Harwell Close.
- 5.8.38 A second access point into the site is proposed directly from Ickenham Road at the north-eastern end of the Ruislip Golf Club's car park and the bridge over the railway line.

## **Breakspear Road South**

- 5.8.39 Breakspear Road South worksite is located on the northern side of the Great Western Mainline railway line on land currently occupied by Schering-Plough animal health clinic. Breakspear Road South is a single-carriageway two-way road with a maximum 40mph speed limit throughout most of its length, reverting to 30mph approximately 60m north of its junction with the B467 Swakeleys Road. It has no footways on either side. It is semi-rural in setting and runs on a northwest-southeast alignment. To the north, from the junction with Fine Bush Lane, Breakspear Road South becomes Breakspear Road North towards Harefield. To the south it connects with the A40 Western Avenue via the B467 Swakeleys Road.

## **Harvil Road**

- 5.8.40 Like Breakspear Road South, Harvil Road is a single-carriageway, two-way semi-rural road. It has a maximum 30mph speed limit between Swakeleys Road and a point approximately 100m north of its junction with The Drive. From this point northwards the speed limit rises to 50mph. South of the railway line Harvil Road has no footways on either side, north of the railway line there is a footway on the western side of the road.
- 5.8.41 Harvil Road lies to the west of Breakspear Road South and east of the Colne Valley. It runs on a north-south alignment, with Harefield to the north and is connected to the A40 Western Avenue to the south via the B467 Swakeleys Road. The M40 junction 1 and junction 16 of the M25 are approximately 3km and 4.5km respectively west of the A40/B467 intersection.

*Baseline conditions*

- 5.8.42 This section examines traffic baseline traffic flows on the strategic and local highway network.

Table 5-g2: South Ruislip to Ickenham 2012 baseline flows

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
West End Road	NB	699	55	915	10
	SB	556	27	630	10
Ickenham Road	NB	803	26	1,108	23
	SB	1,163	86	955	21
Breakspear Road	NB	542	14	755	8
	SB	670	16	482	9
Harvil Road	NB	332	22	378	16
	SB	440	17	440	9
Swakeleys Road (south)	NB	1,663	89	1,453	137
	SB	1,577	136	1,343	79

- 5.8.43 The operation of the main junctions which form the main access routes from the strategic network to the South Ruislip to Ickenham area sites have been analysed for the 2012 existing conditions and the results are summarised below.

**Harvil Road/B467 Swakeleys Road**

- 5.8.44 This three-arm non-signalised roundabout connects Harvil Road with the B467 Swakeleys Road. Both are single lane two-way roads. The northbound approach to the roundabout from the A40 has two lanes; one is dedicated for traffic turning into Harvil Road and other lane is used by traffic to continue along Swakeleys Road towards Breakspear Road South/Swakeleys Road Junction.
- 5.8.45 The westbound approach has two lanes, a dedicated lane to access Harvil Road and the other for southbound traffic to access Swakeleys Road. There are traffic/pedestrian refuge islands on all three approaches to the roundabout with uncontrolled crossing facilities. This roundabout is used by two bus services; U1 with frequency of four buses per hour in each direction and U9 with frequency of three buses per hour in each direction.

Table 5-g3: Baseline performance at junction Harvil Road / Swakeleys Road (roundabout)

	2012 AM baseline
--	------------------

	Flow (PCU)	DoS (%)	Max queue (PCU)
Harvil Road	457	105	8
Swakeleys Road (WB)	983	105	8
Swakeleys Road (EB)	1,475	96	0
<b>2012 PM baseline</b>			
Harvil Road	449	67	1
Swakeleys Road (WB)	889	88	1
Swakeleys Road (EB)	1,217	81	0

- 5.8.46 The roundabout connecting Harvil Road and Swakeleys operates over its capacity during the morning peak hours but within capacity during the PM peak hours.

### Breakspear Road South/B467 Swakeleys Road

- 5.8.47 Breakspear Road South is connected with A467 Swakeleys Road via a three-arm non-signalised mini-roundabout. The eastern arm has two lanes in each direction, while the other two arms are single lane two-way roads widening to two lanes approaching the junction. Northbound traffic approaching the roundabout has two dedicated lanes, one lane for Breakspear Road South and the other to continue on Swakeleys Road eastbound.
- 5.8.48 The westbound approach to the roundabout has two lanes, one is a dedicated lane for traffic to turn right into Breakspear Road South and other lane is used by traffic to access Swakeleys Road southbound. Bus route U1 uses this roundabout with a frequency of four buses per hour in each direction. There is a pedestrian refuge island on the northern arm approach which provides an uncontrolled crossing facility, albeit with low kerbs but no formal crossing or tactile facilities. The approaches on the other two arms have a central median with no crossing facilities for pedestrians.

Table 5-94: 2012 baseline performance at junction Breakspear Road South/Swakeleys Road (mini roundabout)

	<b>2012 AM baseline</b>		
	Flow (PCU)	DoS (%)	Max queue (PCU)
Breakspear Road South	686	87	1
Swakeleys Road (WB)	305	48	8
Swakeleys Road (EB)	1,197	71	0
<b>2012 PM baseline</b>			
Breakspear Road South	491	49	1
Swakeleys Road (WB)	329	48	1
Swakeleys Road (EB)	980	58	0

- 5.8.49 This junction as a whole operates within capacity in AM and PM peak hours. However, Breakspear Road South performs close to capacity in the AM peak, with Swakeleys Road westbound traffic experiencing queuing as a result.

#### **B466 High Road, Ickenham/Long Lane/B467 Swakeleys Road**

- 5.8.50 This is a three-arm non-signalised junction with controlled crossing facilities on the western arm (zebra crossing on Swakeleys Road) and on the southern arm (signalised crossing on Long Lane). There is no pedestrian crossing provision on the northern arm (High Road, Ickenham). All arms are two-way roads.
- 5.8.51 The western approach from Swakeleys Road has two lanes, one dedicated to traffic turning right into Long Lane (southern arm) and one for traffic turning left into High Road, Ickenham (northern arm). The northern approach (High Road, Ickenham) has a one lane dedicated to traffic turning right into the western arm (Swakeleys Road) and another dedicated lane for traffic to access the southern arm (Long Lane). The southern approach (Long Lane) has a single approach lane. Bus service U10 uses this junction with a frequency of four buses per hour in each direction.

Table 5-95: 2012 baseline performance at junction High Road, Ickenham/Long Lane/Swakeleys Road (not signalised)

	2012 AM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
High Road, Ickenham	1,148	43	0
Long Lane	146	17	0
Swakeleys Road	642	58	1
	2012 PM baseline		
	Flow (PCU)	DoS (%)	Max queue (PCU)
High Road, Ickenham	888	42	4
Long Lane	812	52	0
Swakeleys Road	156	53	1

- 5.8.52 The model shows that this junction operates well within its capacity in AM and PM peak hours. High Road, Ickenham is the major road at this junction with higher flows than the other arms.

#### **Accident and safety**

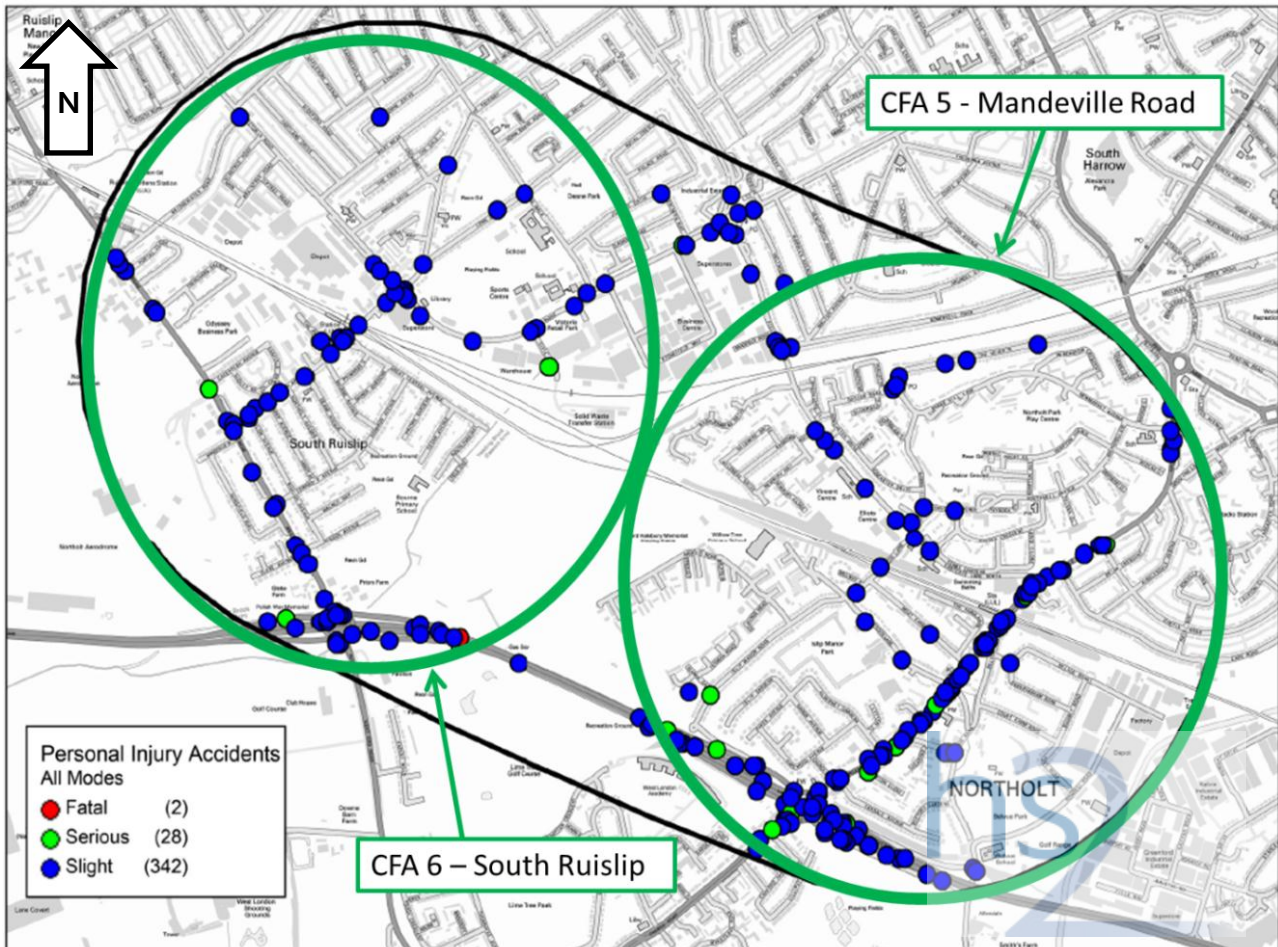
- 5.8.53 Accident data covering a 36-month period to the end of March 2012 was obtained from TfL and the analysed information is presented below.

#### **South Ruislip**

- 5.8.54 Figure 5-56 below indicates the location and severity of PIAs in the South Ruislip area (also showing the nearby Mandeville Road site in CFA5).

- 5.8.55 A total of 372 PIA occurred over the three year period in the study area, an average of 124 per year. It can be seen that there are three distinct accident clusters on the A40 and along A4180 West End Road and Station Approach.

Figure 5-56: South Ruislip area, all accidents (number, location and severity)



Source: TfL

- 5.8.56 Table 5-96 below shows that the level of accidents recorded in the vicinity of Victoria Road, South Ruislip.

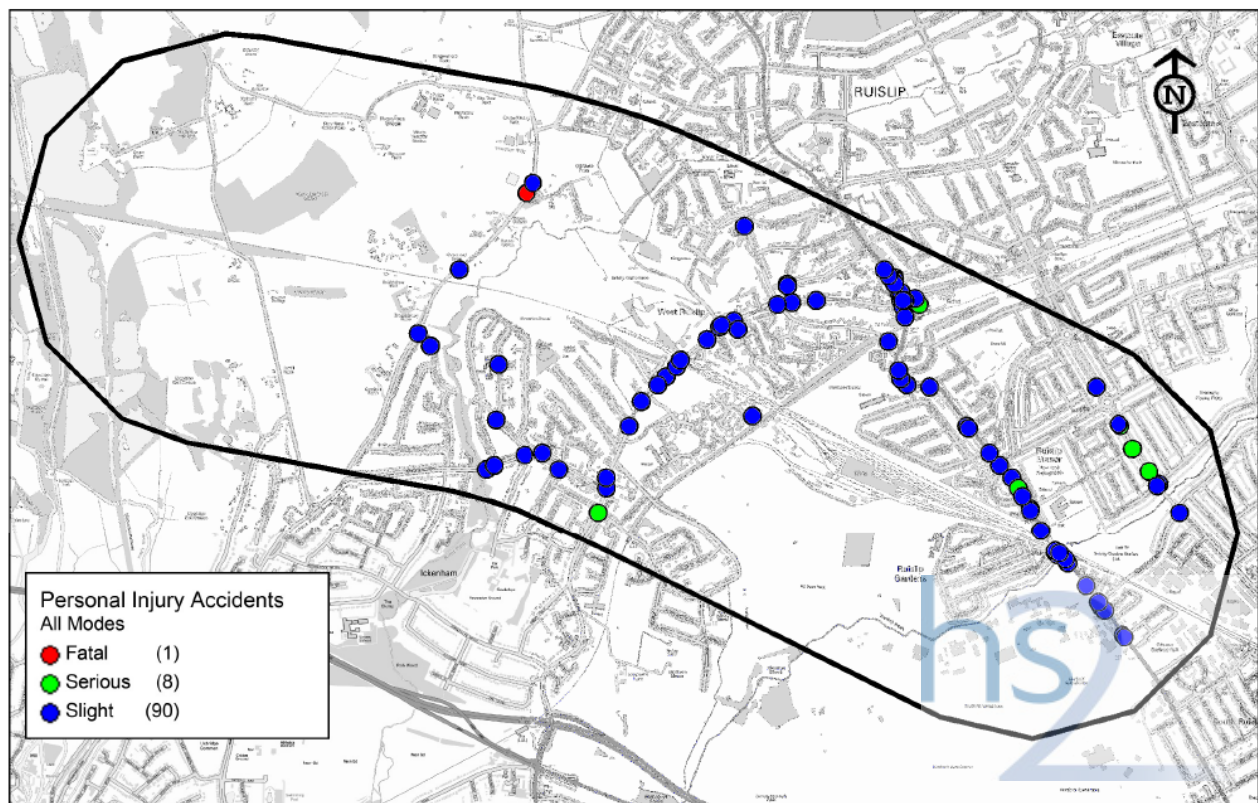
Table 5-96: Accidents records – South Ruislip

Area	Fatal	Serious	Slight	Total Accidents
CFA6 – South Ruislip	2	28	342	372
Mean PIA per annum	0.7	9.3	114	124

### West Ruislip and Breakspear Road South

- 5.8.57 Figure 5-57 below indicates the location and severity of PIAs in the West Ruislip area.

Figure 5-57: West Ruislip area, all accidents (number, location and severity)



Source: TfL

5.8.58 A total of 99 PIA occurred over the three year period in the study area, an average of 33 per year. It can be seen that there are two distinct accident clusters along the A4180 West End Road and the B466 Ickenham Road.

5.8.59 Table 5-97 below shows the level of accidents recorded in the vicinity of Ickenham Road and Breakspear Road.

Table 5-97: Accidents records – West Ruislip and Breakspear Road area

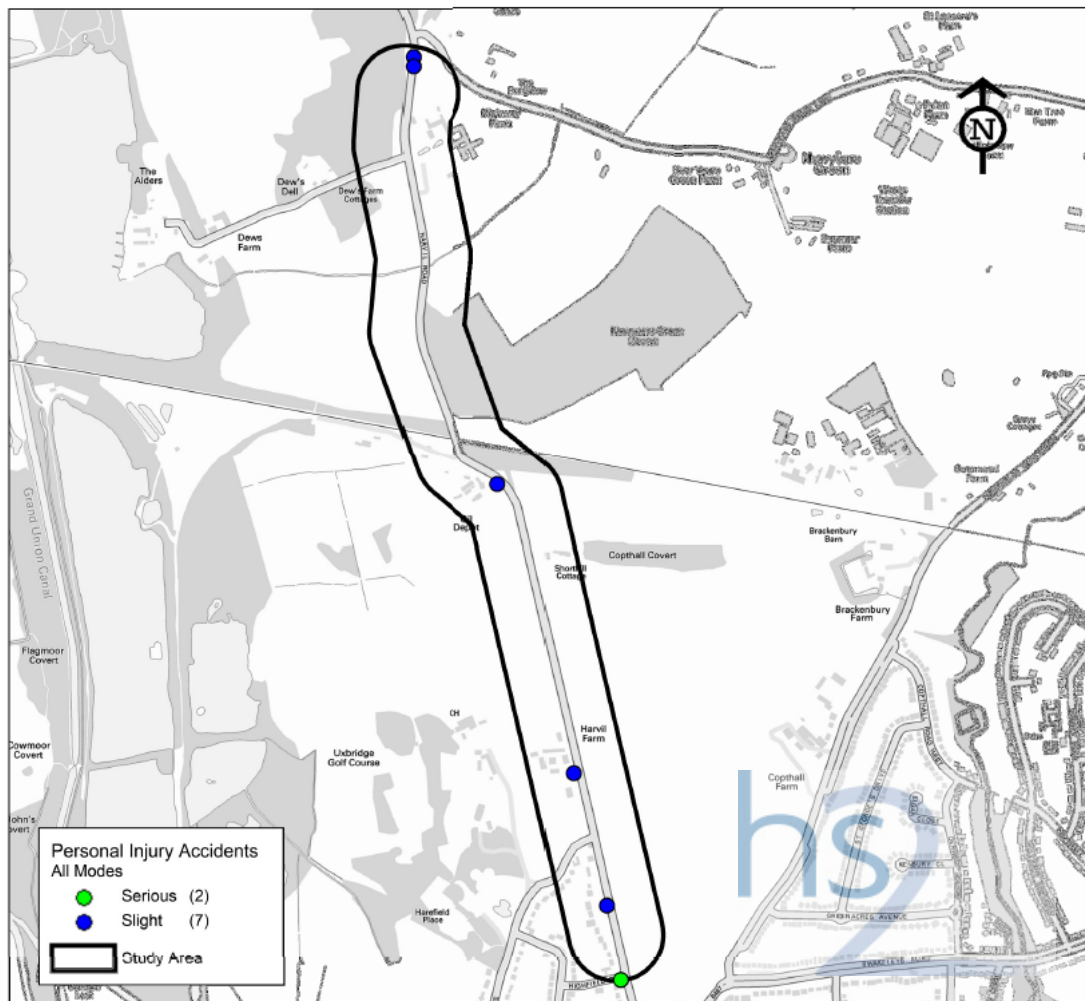
Area	Fatal	Serious	Slight	Total Accidents
CFA6 – West Ruislip and Breakspear Road area	1	8	90	99
Mean PIA per annum	0.3	2.7	30	33

**Harvil Road**

5.8.60 Figure 5-58 below indicates the location and severity of PIAs in the Harvil Road area



Figure 5-58 Harvil Road area, all accidents (number, location and severity) (source: TfL)



5.8.61 A low number of accidents were recorded on Harvil Road over the three year period. Of the 9 accidents recorded in the Harvil Road area, 7 were classified as slight and 2 as serious injuries. There were no fatal accidents.

5.8.62 Table 5-98 summarises the level of accidents recorded in the vicinity of Harvil Road area.

Table 5-98 Accident Records – Harvil Road area

Area	Fatal	Serious	Slight	Total Accidents
CFA6 – Harvil Road area	0	2	7	9
Mean PIA per annum	0	0.7	2.3	3

## Parking and loading

### Parking controls

5.8.63 This section describes the parking controls in the vicinity of the Proposed Scheme and presents the results of the parking occupancy surveys undertaken in 2012.

### **South Ruislip**

- 5.8.64 To east of the worksite, parking restrictions on Victoria Road vary between double yellow lines, single yellow lines and sections of un-marked kerb spaces. The business/retail parks and residential enclosures surrounding the worksite have no parking restrictions.
- 5.8.65 Restrictions apply to the single yellow lines Monday – Saturday between 08:00–18:30. However general parking is un-restricted towards the western section of Victoria Road.
- 5.8.66 Long Drive and Station Approach is within a control parking zone which has the restrictions Monday – Friday between 09:00–17:00.

### **West Ruislip**

- 5.8.67 Parking on the B466 Ickenham Road is prohibited on the southern side of the Ickenham Road bridge except for an area outside a parade of shops which is restricted to Monday – Friday 08.00–9.30 and 16.30–18.30. The same restriction applies to a section of yellow lines on the northern side of the bridge close to the proposed works entrance near Hill Lane. Double yellow line 'no parking at any time' restrictions are marked over the bridge on Ickenham Road and on Hill Lane.
- 5.8.68 There is a large private car park (approximately 200+ spaces) at Ruislip Golf Club and West Ruislip station has a car park with 136 spaces.

### **Breakspear Road South/Harvil Road**

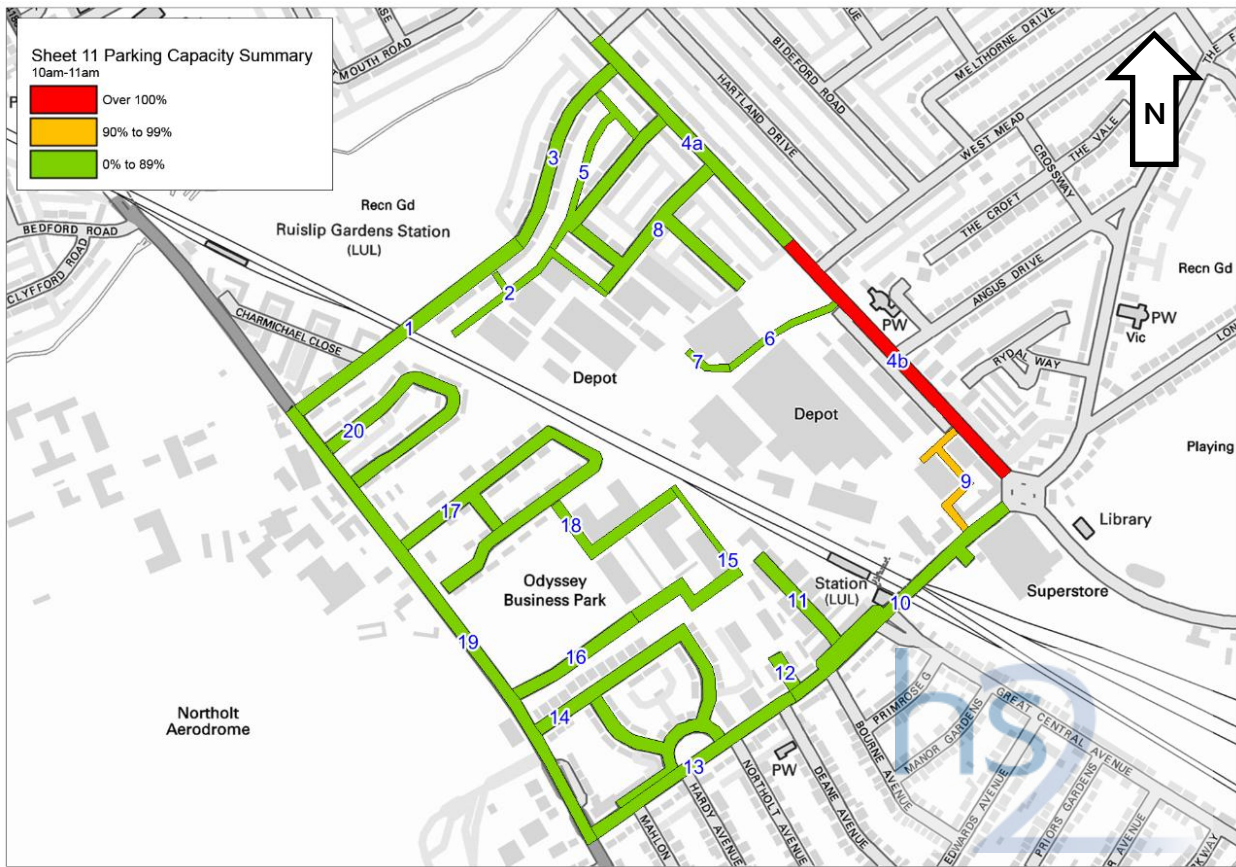
- 5.8.69 There are no parking restrictions in the vicinity of the Breakspear Road South worksite.

### *Parking occupancy surveys*

#### **South Ruislip**

- 5.8.70 The parking demand at South Ruislip area is shown in Figure 5-59.

Figure 5-59: South Ruislip area parking survey plan



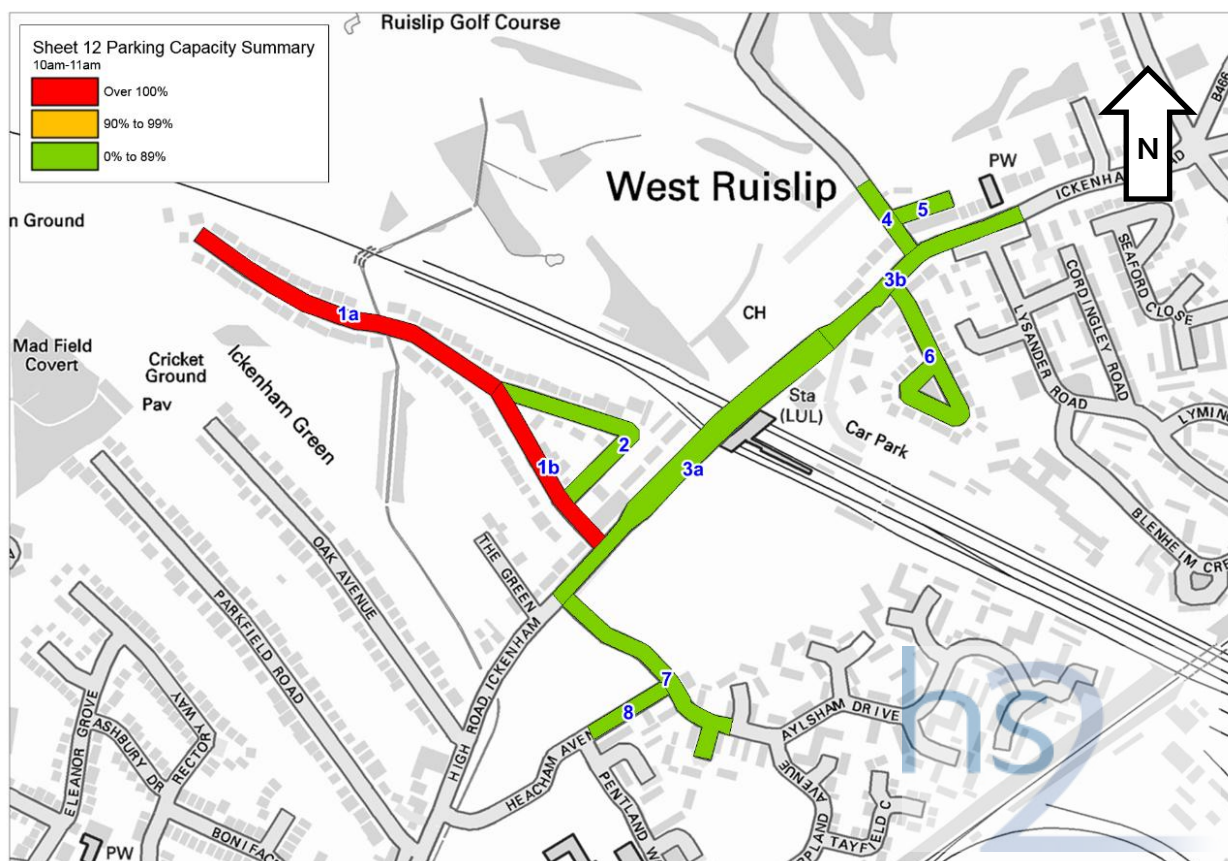
5.8.71 Figure 5-59 shows that demand is high on Victoria Road to the south / east of the site. However, parking demands are lower on streets to the west.

### West Ruislip

5.8.72 There is a station car park adjacent to West Ruislip station. The station car park is located adjacent to the northern side of the tracks and is accessed via a slip lane from Ickenham Road which commences approximately 130m north of the main station building. The access lane also serves some adjacent commercial premises.

5.8.73 Figure 5-60 shows the locations of parking occupancy surveys in the West Ruislip Portal area. Links 3a, 3b, 4, 5 and 6 are closest to the proposed site compound access.

Figure 5-60 West Ruislip area parking survey location plan



- 5.8.74 The survey indicates that the roads local to the proposed site access do not experience high levels of on street parking. However The Greenway residential street to the south of the proposed site experiences a higher level demand.

### Breakspear Road South/Harvil Road

- 5.8.75 Due to the rural nature and lack of residential or commercial development along Breakspear Road South, a parking survey has not been carried out in this area.

### Public transport

- 5.8.76 The following sections describe the rail, bus and coach services in the area.
- 5.8.77 The South Ruislip to Ickenham area is well served by public transport with rail services operated by Chiltern Railways, LU Piccadilly, Metropolitan and Central lines and a number of TfL suburban bus routes passing through the area. Bus routes are more numerous towards the eastern (more populated) part of the study area.

### Rail network

- 5.8.78 Rail services from Marylebone station operated by Chiltern Railways pass through the area. The Chiltern Main Line service to Birmingham stops at West Ruislip station.

- 5.8.79 Passenger flows at the stations in the area are summarised in Table 5-99 and described in more detail below.

Table 5-99: LU and rail station passenger movements (LU/NR)

Station Name	Station Type	Direction	Daily	Annual	Stations Daily		TfL Annual
			Total	2010/2011	Entry	Exit	Annual LUL
				Entries & Exits	Weekday	Weekday	Entries & Exits
Northolt	LU	Eastbound	6748	-	6,887	6,540	4,279,014
		Westbound	143		-	-	-
South Ruislip	LU+NR	-	-	135,928	2,935	2,664	1,756,903
Ruislip Gardens	LU	-	-	-	1,746	1,481	1,002,292
West Ruislip	LU+NR	-	-	258,550	2,613	2,428	1,640,785

### South Ruislip

- 5.8.80 South Ruislip LU and rail station is located approximately 450m to the east of the site compound. The station serves the LU Central line and the Chiltern services in Travel Card Zone 5.
- 5.8.81 A typical daily weekday LU passenger movement is 2,900 entries and 2,600 exits or about 2 million underground passengers in a year. In addition there are approximately 136,000 annual rail passengers using South Ruislip station.
- 5.8.82 Ruislip Gardens LU station on the Central Line is approximately 500m to the west in travel Zone 5.
- 5.8.83 The typical daily weekday passenger movement at Ruislip Gardens LU station is 1,700 entries and 1,400 exits or about 1 million annual passengers.

### West Ruislip

- 5.8.84 West Ruislip LU and rail station is located on the B466 Ickenham Road and is approximately 300m to the southwest of the Proposed Scheme. The station serves the LU Central line and the Chiltern services in Travel Card Zone 5.
- 5.8.85 A typical daily weekday LU passenger movement is 2,600 entries and 2,400 exits or about 2 million underground passengers in a year. In addition there are approximately 260,000 annual rail passengers using West Ruislip station.

### Breakspear Road South

- 5.8.86 There are no rail stations close to Breakspear Road South. There are no other public transport interchange facilities in the vicinity.

## Harvil Road

5.8.87 There are no rail stations close to the Harvil Road area.

### *Local bus services*

5.8.88 There is a limited range of bus service provision in the local area comprising local buses with no significant coach services. The local bus network serving the core study areas as shown on Figure 5-61 and Figure 5-62.

## South Ruislip

5.8.89 The local bus network in this area is shown on Figure 5-61.

5.8.90 Victoria Road carries a single daytime bus service, Route 114 between Mill Hill Broadway and Ruislip.

5.8.91 The two bus stops closest to the worksite are located on Victoria Road. Stop R for the westbound service is located approximately 60m west of the site access and stop H for the eastbound service is located directly opposite the site access.

5.8.92 Table 5-100 shows bus frequencies in the South Ruislip portal area.

Table 5-100: South Ruislip area bus frequencies (source: derived from TfL bus information)

Service number	Route	AM peak (buses/hr)	Inter-peak (buses/hr)	PM peak (buses/hr)
E7	Ealing - Ruislip	7	7	7
114	Mill Hill Broadway - Ruislip	8	7	7

## West Ruislip





5.8.93 The local bus network in this area is shown on Figure 5-62.




Figure 5-61 Bus routes that serve South Ruislip and surrounds

### Buses from South Ruislip

### Key

-  Connections with London Underground
-  Connections with London Overground
-  Connections with National Rail
-  Daytime shopping hours only.  
Please see timetable for further details

 Red discs show the bus stop you need for your chosen bus service. The disc **A** appears on the top of the bus stop in the street (see map of town centre in centre of diagram).

## Route finder

### Day buses

Bus route	Towards	Bus stops
<b>114</b>	Mill Hill Broadway	B H J K L
	Ruislip	A W N P R
<b>282</b>	Ealing Hospital	W X Y
	Mount Vernon Hospital	S T V
<b>E7</b>	Ealing Broadway	C F
	Ruislip	D E

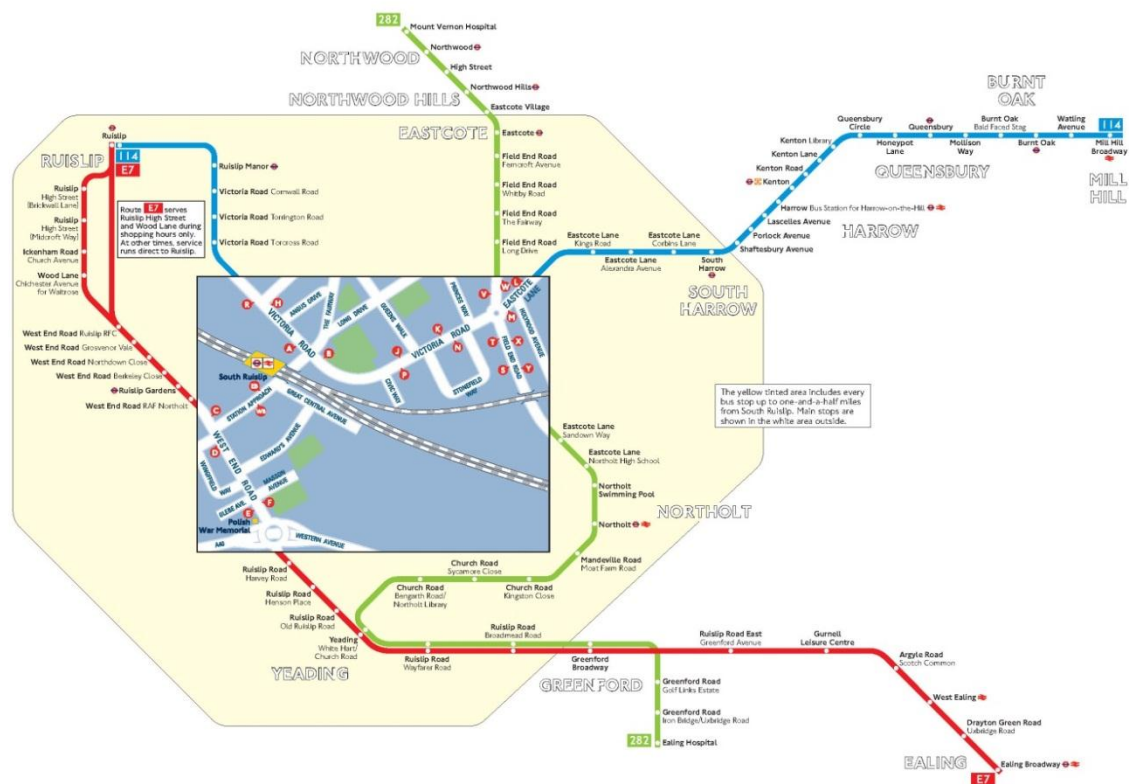



Figure 5-62 Bus routes that serve West Ruislip and surrounds

Buses from West Ruislip








**Key**

- Connections with London Underground
- Connections with National Rail
- Mondays to Saturdays daytime except evening
- Daily during shopping hours only - please check timetable

Red discs show the bus stop you need for your chosen bus service. The disc  appears on the top of the bus stop in the street (see map of town centre in centre of diagram).

**Route finder**

**Day buses**

Bus routes	Towards	Bus stops
<b>E7</b>	Ealing ▼	 
	Ruislip ▼	 
<b>U1</b>	Ruislip	   
	West Drayton	   
<b>U10</b>	Heathfield Rise +	   
	Uxbridge +	   



5.8.94 The road carrying buses closest to the West Portal worksite is Ickenham Road. Ickenham Road carries two daytime bus services - route U1 between Ruislip and west Drayton and route U10 between Heathfield Rise and Uxbridge.

5.8.95 The nearest bus stops to the site access for these routes are located approximately 170m to the north (Stop N) and 240m south, next to West Ruislip station (Stops M & S).

5.8.96 Table 5-101 shows bus frequencies in the West Ruislip portal area.

Table 5-101: West Ruislip area bus frequencies (source: derived from TfL bus information)

Service number	Route	AM Peak (buses/hr)	Inter Peak (buses/hr)	PM Peak (buses/hr)
E7	Ealing - Ruislip	7	7	7
U1	Ruislip – West Drayton	5	5	4
U10	Heathfield Rise - Uxbridge	1	1	1
H13	Northwood Hills –Ruislip Lido	3	3	3

### Breakspear Road South

5.8.97 Breakspear Road South is not on a bus route. Bus passengers will not, therefore, be affected by the temporary closure of Breakspear Road South.

### Harvil Road

5.8.98 Harvil Road carries a single daytime bus service; Route U9 between Harefield and Uxbridge. There are no bus stops near the proposed worksite area. The closest bus stops are approximately 1km from the worksite. Table 5-102 shows bus frequencies in the West Ruislip portal area.

Table 5-102: Harvil Road area bus frequencies (source: derived from TfL bus information)

Service number	Route	AM peak (buses/hr)	Inter-peak (buses/hr)	PM peak (buses/hr)
U9	Harefield- Uxbridge	3	3	3

### Coach services

5.8.99 There are no dedicated coach service facilities within CFA6. However, long distance coach services, primarily using the M25, M40 and A40, operate from the nearest hub at Heathrow Airport (approximately 15km south of West Ruislip) serving key destinations across the UK.

### *Taxis*

- 5.8.100 There are no major dedicated taxi facilities on the public highway in the vicinity of the study area. However, this does not preclude the ability to pick-up/set down in these areas.

### *Public transport interchanges*

- 5.8.101 There are no major multi-modal inter changes within CFA6.

#### **South Ruislip**

- 5.8.102 Interchange with buses at South Ruislip station is provided on Station Approach approximately 100m south of the station. There are no other public transport interchange facilities in the vicinity of the proposed worksite.
- 5.8.103 Interchange with buses at Ruislip Gardens Underground station is available on A4180 West End Road. A bus stop for northbound buses is located opposite the station and the southbound bus stop is situated approximately 60m south of the station.

#### **West Ruislip**

- 5.8.104 Interchange with buses at West Ruislip Underground and Rail station is provided on A466 Ickenham Road. A bus stop for the southbound buses is located outside the station and the bus stop for the northbound buses is situated approximately 60m to the north of the station. There are no other public transport interchange facilities in the vicinity of the proposed worksite.

#### **Breakspear Road South/Harvil Road**

- 5.8.105 There are no public transport interchanges in the vicinity of the Proposed Scheme at Breakspear Road South and Harvil Road.

### *Pedestrians, cyclists and equestrians*

- 5.8.106 The following section describes the pedestrian and cycle facilities in the CFA6 study area.
- 5.8.107 There are no footways in the vicinity of the proposed Breakspear Road South site and Harvil Road only has a footway on the west side of the road to the north of the railway line. Footways are provided in the built up areas of Ickenham, Ruislip and West Ruislip.
- 5.8.108 There are a total of ten PRoW in the vicinity of the Proposed Scheme in this area and surveys to capture usage levels on those crossed by the scheme were undertaken in August 2012 and covered the weekend AM peak (08:00 – 09:00) period.

- 5.8.109 In general, the surveys recorded very low levels of pedestrian activity over weekday periods. There are also routes in and around Ruislip golf course that will be affected by the scheme both during construction and for the operational scheme.
- 5.8.110 Ickenham Road has advisory cycle lanes in each direction in the vicinity of the site and mandatory lanes in each direction over the railway bridge. Hill Lane provides cycle access across Ruislip Golf Club via a shared pedestrian and cycle path.

### *Pedestrian facilities*

#### **South Ruislip**

- 5.8.111 There are footways along the delivery access road adjacent to the disused DIY store leading to the vent shaft worksite. Footways exist along the entire length of Victoria Road and all residential streets in the vicinity of the proposed works.
- 5.8.112 All crossing facilities in close proximity to the worksite have dropped kerbs to assist the mobility impaired to cross roads safely. The signalised crossings at the junctions also have guardrails.
- 5.8.113 Push button pedestrian crossing facilities are located at the following traffic signalised junctions:
- Victoria Road junction with West Mead – all four arms including the access road of the disused DIY store;
  - Long Drive junction with Victoria Road – all four arms;
  - Station Approach outside South Ruislip station; and
  - Station Approach junction with West End Road - West End Road northern arm only.
- 5.8.114 Uncontrolled pedestrian crossings are installed in the following locations:
- Station Approach 50m west of Bourne Avenue junction; and
  - Station Approach east of Northolt Avenue junction.

#### **West Ruislip**

- 5.8.115 A pedestrian footway is provided along one side of Hill Lane which leads to the proposed access of the West Portal worksite, currently leading to Ruislip Golf Club. Footways exist along the entire length of the B466 Ickenham Road and all residential streets in the vicinity of the worksite.
- 5.8.116 A staggered pedestrian pelican crossing with push button facilities, dropped kerb and tactile kerb paving is located outside West Ruislip station entrance.

- 5.8.117 A further staggered pelican crossing is provided just south of The Greenway on the southern side of the B466 Ickenham Road bridge.
- 5.8.118 Uncontrolled pedestrian refuges/traffic islands, with no tactile pedestrian paving are installed on B466 Ickenham Road at the following locations:
- north of Lysander Road;
  - south of Hill Lane;
  - north of the station approach road at the northern end of the railway bridge; and
  - south of The Greenway.
- 5.8.119 The Hillingdon Trail PRoW crosses the Proposed Scheme at the southern end of Ruislip Golf Course. The trail is a 20 mile path which runs through from Cranford Park, Harlington to the south of the West Ruislip area to Harefield to the north.
- 5.8.120 The section of the Hillingdon Trail in close proximity to the worksite cuts across Ruislip Golf Club from Woodville Gardens to the north and the B466 Ickenham Road to the south running under the railway lines and The Greenway.
- 5.8.121 The Hillingdon Trail can be accessed from the B466 Ickenham Road north of the railway lines via Hill Lane. Hill Lane PRoW connects the northern and southern sections of Hill Lane.

### **Breakspear Road South area**

- 5.8.122 Very few pedestrian facilities exist in close proximity to the Breakspear Road South worksite. There are no footways along the section of Breakspear Road South in the vicinity of the worksite.
- 5.8.123 There are two PRoW in the vicinity Breakspear Road South worksite, both of which can be accessed from Breakspear Road South:
- a footpath adjacent to Dunster Cottage leading east which connects with the north / south running Celandine Route; and
  - a footpath (included in Celandine Route survey below) which commences opposite the Schering-Plough, running in an east-west direction and connecting with the north-south running Celandine Route where it crosses the Proposed Scheme at the River Pinn.
- 5.8.124 The Celandine Route PRoW runs parallel with the River Pinn where it crosses the Proposed Scheme near Breakspear Road South.



## Harvil Road

- 5.8.125 A pedestrian footway is provided on the west side of Harvil Road to the north of the railway line. There are no other footways provided on Harvil Road. No actual survey was carried out but, based on the surveys of PRoWs and on the location it is assumed that the number of pedestrians using this footway is low. There are no crossing facilities close to the Harvil Road worksite.
- 5.8.126 A footpath extends from Harvil Road across fields to the south of Copthall Covert to Breakspear Road South and passing Brackenbury House
- 5.8.127 Five footpaths/tracks are located over land to the north of St. Leonard's Farm on the northern side of Newyears Green Lane.

### *Non-motorised user flows*

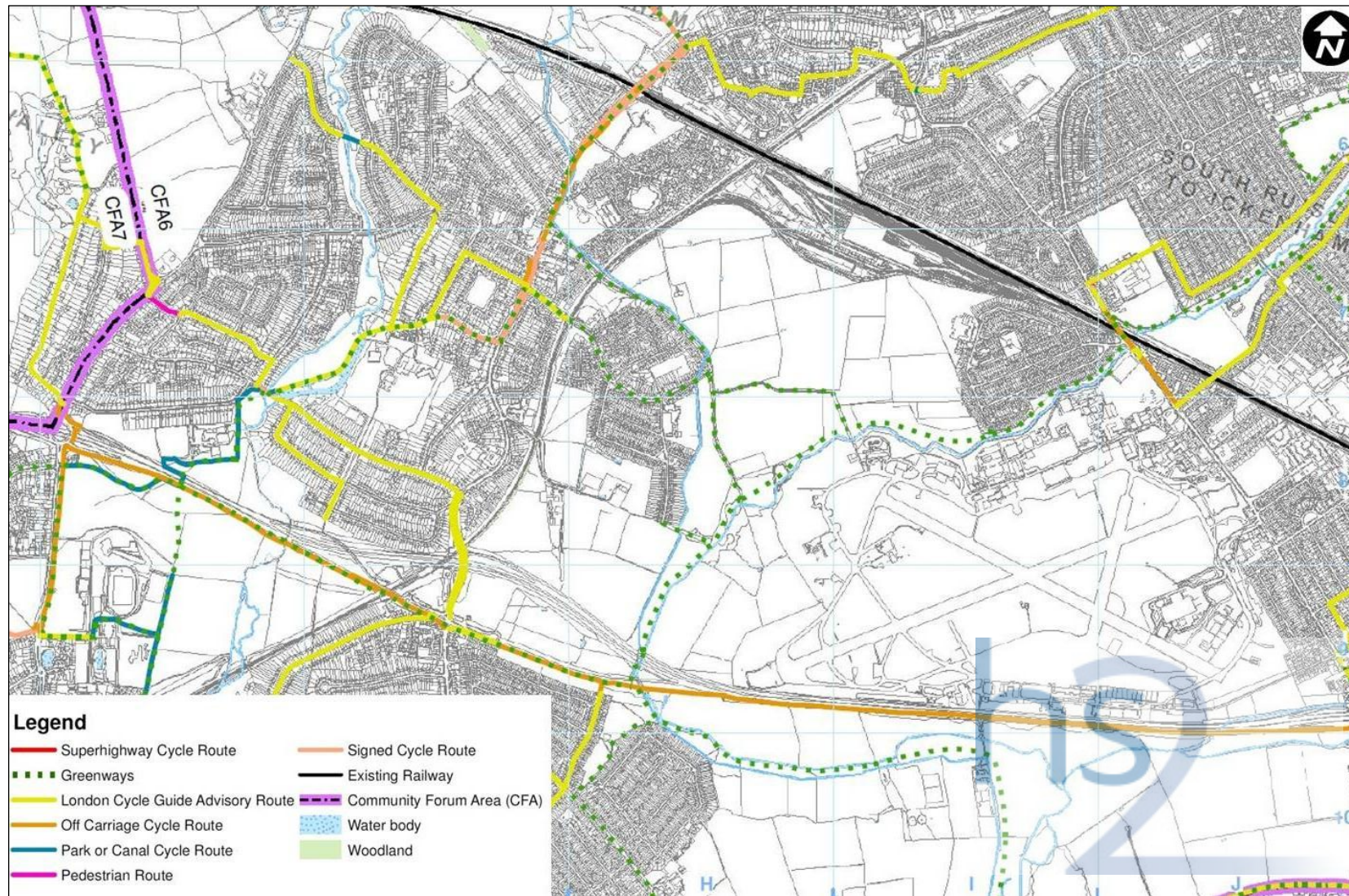
- 5.8.128 Table 5-103 below lists the survey locations/ routes where use by pedestrians, cyclists and horses exceeded 20 per day. The survey locations are contained in the Baseline Survey Report in Annex B(ii).

Table 5-103 – Non-motorised user survey locations

Site	Description of location	Number of users (August)
12.2a	South Ruislip - Hillingdon Trail north of The Greenway	20
12.1	West Ruislip - North of Hill Lane north-south	66
12.1	West Ruislip - Hill Lane east-west	178
12.1	West Ruislip - Golf Club Access Road	20
12.4	Breakspear Road South - Celandine route by Dunster Cottages	27
12.3	Breakspear Road South - Celandine route by Schering-Plough	23

- 5.8.129 In total, 18 usage surveys were undertaken in August 2012. Three of the routes were used by less than 20 people in the 10 hour survey period. The routes with the greatest usage were all at Hill Lane and were as a result of the pedestrian movements to and from the residential part of Hill Lane and the residential area to the north. Cycle facilities
- 5.8.130 The cycle network within CFA5 is shown in Figure 5-63.

Figure 5-63: Cycle Routes within CFA6



### **South Ruislip**

- 5.8.131 Long Drive north of the railway bridge is a quieter road recommended for cyclists. This connects with east-west running Great Central Avenue to the south and east of the railway bridge, taking cyclists towards segregated routes adjacent to the A40 Western Avenue.
- 5.8.132 On-street cycle stands are installed in the following locations;
- Victoria Road outside parade of shops opposite the disused DIY store – two stands;
  - Long Drive northern side outside parade of shops to east of Victoria Road – two stands; and
  - Station Approach northern side outside main entrance to South Ruislip underground/rail station – three stands.

### **West Ruislip**

- 5.8.133 Outside the West Ruislip station, mandatory cycle lanes are provided on B466 Ickenham Road in each direction and cycle parking sufficient for about 20 cycles is located immediately in front of the station entrance.
- 5.8.134 High Road Ickenham is part of a signed cycle route which TfL defines as a route which may be on busier roads. Hill Lane provides cycle access across Ruislip Golf Club via a shared pedestrian and cycle path.

### **Breakspear Road South/Harvil Road**

- 5.8.135 There are no cycle facilities in the immediate area.

### *Equestrian facilities*

- 5.8.136 U42 public bridleway extends from the existing Schering-Plough access northwards towards Newyear's Green Lane. No activity was recorded on the U42 public bridleway at Breakspear Road South during the period of the survey in August 2012.

### **Waterways/canals**

- 5.8.137 There are no navigable waterways or canals in the local area.

### **Air transport**

- 5.8.138 The RAF Northolt Aerodrome lies 1.8km to the south east of the Proposed Scheme at West Ruislip. Operations at the aerodrome are not anticipated to be affected either by the construction or operation of the Proposed Scheme.



## 5.9 Colne Valley (CFA7)

### Study area

- 5.9.2 This section provides an overview of the baseline traffic and transport conditions for the Colne Valley area (CFA7). It describes the transport infrastructure within the study area, which will be affected either by the construction or the operation of the Proposed Scheme.
- 5.9.3 The Proposed Scheme through the study area will be approximately 5.7km in length. It will commence from the boundary of a re-aligned Harvil Road, north of Ickenham and will proceed north-west on a viaduct through the Colne Valley, passing west of South Harefield and east of Denham Green, over the Grand Union Canal, Mid Colne Valley Site of Special Scientific Interest (SSSI), River Colne, a number of lakes and A412 Denham Way/North Orbital Road.
- 5.9.4 The route will then continue in a north-west direction passing west of West Hyde in a series of cuttings and embankments before entering the Chiltern tunnel via the Chiltern tunnel south portal, immediately east of the M25. The Proposed Scheme will leave this area in a tunnel at the M25, between junctions 16 and 17, east of Chalfont St Peter.
- 5.9.5 The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFA7 Report).
- 5.9.6 The scope of the assessment has been discussed with HA, Buckinghamshire CC and Hertfordshire County Council (HCC). The LBH and TfL were also consulted on the scoping of the assessment.
- 5.9.7 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from south to north along the proposed route.

### Local land uses

- 5.9.8 The route of the Proposed Scheme through the study area is between the suburban fringe of London and the Chilterns. Agricultural land is interspersed with urban development linked to commuter towns and villages, including Ickenham, Denham, Denham Green, West Hyde, Harefield and South Harefield and Maple Cross.
- 5.9.9 The Colne Valley Regional Park, which includes the Mid Colne Valley SSSI, is focused around the Colne Valley lakes, the Grand Union Canal and the River Colne. These water features runs in a north-south direction and are used for a range of leisure activities.

## Surveys

- 5.9.10 Transport surveys have been undertaken to obtain baseline data in order to undertake an impact assessment of the Proposed Scheme. Traffic surveys, which in some cases included non-motorised user surveys, were undertaken in June and September 2012 and February 2013. Additionally, surveys specifically recording non-motorised users on PRoW were undertaken in August and September 2012.
- 5.9.11 Further details of the traffic and non-motorised user surveys and schedules for each survey undertaken are included in the Baseline Survey Report in Annex B(iii).

### *Traffic surveys*

- 5.9.12 Traffic surveys were undertaken to establish current traffic flows on the road network subject to assessment, during June and September 2012 and February 2013. The surveys comprised:
- automatic traffic counts (ATC) on highway links. ATC data was gathered for a continuous two week period; and
  - classified turning count and queue length surveys at highway junctions. Surveys were undertaken on a weekday (Tuesday, Wednesday or Thursdays) between 07:00 and 10:00, and 16:00 and 19:00.
- 5.9.13 The survey data was further supplemented by traffic and transport data obtained from other sources where available, including from the HA, Buckinghamshire CC and HCC.

### *Non-motorised user surveys*

- 5.9.14 PRoW surveys were undertaken in August and September 2012, to establish the nature of the PRoW and their usage by pedestrians, cyclists and equestrians (non-motorised users). The surveys included all PRoW and roads that will cross the Proposed Scheme and any additional PRoW that will be affected by the Proposed Scheme.
- 5.9.15 The August surveys were carried out between 08:00 and 18:00 on a Sunday to capture users of footpaths, bridleways and some country lanes, where they were identified as being on a National Trail or Long Distance Route. Surveys were undertaken during the summer holidays in order to record maximum recreational usage. September surveys were carried out between 07:00 and 19:00 on a weekday (Tuesday, Wednesday or Thursdays) to capture only users of roads and associated footways. Surveys were undertaken outside of the school holidays in order to record non-recreational usage, such as school and commuting users.

## Highway network

- 5.9.16 The main strategic roads and local roads affected by the Proposed Scheme are the M25, M40, A40, A413, A405, A412 Denham Way/North Orbital Road, B467 Swakeleys Road, Harvil Road, Tilehouse Lane, Denham Green Lane, Chalfont Lane, Hornhill Road, Woodland Road, Moorhall Road/ Moorfield Road and Chalfont Road. The Proposed Scheme crosses four roads within the study area.

## Strategic road network

### Motorway network

- 5.9.17 The M25 is a 188 km motorway that almost encircles Greater London and forms the western boundary of the study area. At the location where the Proposed Scheme is in tunnel beneath the M25, the clockwise carriageway has four lanes and the anti-clockwise three lanes. To the north of the Proposed Scheme is junction 17, facilitating access to the towns of Rickmansworth and Maple Cross. To the south of the Proposed Scheme route is junction 1A, linking the M40 which connects London to the east (via the A40 to Birmingham).
- 5.9.18 The M40 is a motorway connecting London with Birmingham. It is dual three lanes, except for junction 1A to junction 3 which is dual four lanes, a short section past junction 4 which is dual two lanes, and a short section past junction 9, which is two lanes southbound. Within the study area, the M40 runs to the south of the Proposed Scheme. Junction 1, where the motorway commences, connects with the A40 to London, the A412 to Slough and the A4020 to Uxbridge. Junction 1A connects with the M25 northbound and southbound.

### Primary 'A' roads

- 5.9.19 The A40 is a major trunk road connecting London with Goodwick in Wales. Within the study area, the A40 is dual three lanes and runs to the south of the Proposed Scheme and flows into the M40, at Denham Roundabout.
- 5.9.20 The A413 links Gerrards Cross with Towcester, passing through several towns in Buckinghamshire, including Buckingham, Aylesbury, Wendover and Amersham. Within the study area, the A413 runs to the south of the Proposed Scheme, although does not intersect the route until further north, at Chalfont St Giles. The A413 is single carriageway within the study area.

### Non-Primary 'A' roads

- 5.9.21 The A405 Kingsway (North Orbital Road) is dual carriageway, running between Kingsway, at the junction with the A41, and the A414, south of St Albans. Within the study area, the A405 and A412 Denham Way/North Orbital Road connects to the M25 at Junction 17.



- 5.9.22 The A412 links Slough and Watford and provides interchange to the A40/M40 at the Denham Roundabout, the M25 Junction 17 in Maple Cross, the A404 in Rickmansworth, and the A41 in Watford. Within the study area, the A412 Denham Way/North Orbital Road runs in a south to north direction and intersects the Proposed Scheme to the north of Denham Green, when the Proposed Scheme is on viaduct.

### *Local road network*

- 5.9.23 Local roads, which are either intersected by, or impacted by the Proposed Scheme are:
- B467 Swakeleys Road (two-way single carriageway);
  - Harvil Road (two-way single carriageway);
  - Tilehouse Lane (two-way single carriageway);
  - Denham Green Lane (two-way single carriageway);
  - Chalfont Lane (single carriageway with passing places);
  - Hornhill Road (single carriageway with passing places);
  - Woodland Road (two-way single carriageway);
  - Moorhall Road/ Moorfield Road (two-way single carriageway); and
  - Chalfont Road (single carriageway with passing places).

### *Baseline conditions*

- 5.9.24 2012 base year traffic volumes on the roads subject to assessment have been derived from a combination of traffic surveys and traffic data obtained from other sources, where available.
- 5.9.25 The following volumes have been recorded:
- 24 hour average annual daily traffic (AADT) combined flows in number of vehicles, with proportions of heavy goods vehicles (HGVs);
  - 12 hour average annual weekday traffic (AAWT) combined flows in number of vehicles, with proportions of HGVs; and
  - AM (08:00-09:00) and PM (17:00-18:00) peak hour combined flows in number of vehicles, with proportions of HGVs.

Table 5-104: Colne Valley 2012 baseline flows (vehicles)

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
M25 Junction 17	AC Offslip	930	58	499	20
	CW Offslip	343	20	300	12
	AC Onslip	527	15	221	9
	CW Onslip	524	8	648	4
M25 Junction 17 to 18	AC J18 to J17	5,045	667	5,298	451
	CW J17 to J18	5,345	635	6,691	503
M25 Junction 16 to 17	AC J17 to J16	4,681	448	5,028	324
	CW J16 to J17	5,102	520	6,285	392
B467 Swakeleys Road (Hillingdon)	NB	1,373	50	1,125	40
	SB	1,192	104	1,134	39
A40 (between J1 and Swakeleys Rd junction) (Hillingdon)	EB	4,034	211	4,411	145
	WB	3,818	249	4,382	156
A40 (between J1 and A412 Denham Way) (Denham)	NB	1,605	58	1,693	33
	SB	2,263	100	1,837	43
A40 (between A412 Denham Way and A413) (Bakers Wood)	EB	1,757	53	1,652	28
	WB	1,364	41	1,616	17
A412 Denham Way (between A40 and Moorfield Rd) (Denham)	NB	887	20	928	18
	SB	1,169	39	934	15
A412 Denham Way/ North Orbital Road (south of satellite compounds) (Denham Green)	NB	354	8	596	5
	SB	551	15	433	4
A412 Denham Way/ North Orbital Road (north of satellite compounds) (Denham Green)	NB	354	8	596	5
	SB	551	15	433	4
A412 Denham Way/ North Orbital Road (Maple Cross)	NB	418	16	810	12
	SB	715	28	412	9
A405 Denham Way/ North Orbital Road (North of A412)	NB	739	23	977	13
	SB	1,169	71	723	27
A412 Uxbridge Road (Mill End)	EB	621	20	940	12
	WB	845	18	625	10

- 5.9.26 Further information on 2012 baseline traffic data is provided in the Baseline Survey Report in Annex B(iii).

### **Accidents and safety**

- 5.9.27 Relevant accident data for the roads subject to assessment has been obtained from the HA for the five year period of 2007 to 2011 and from Buckinghamshire CC and HCC for the three year period of 2009 to 2011.
- 5.9.28 The accident data has been interrogated and any clusters of nine or more accidents over a three year period, within 20m of a junction or within 150m on any sections of road between junctions, have been identified. No such accident clusters have been identified in the area.

### **Parking and loading**

- 5.9.29 Locations where existing public parking and loading will be potentially affected by the Proposed Scheme have been established from site observations and desktop review. This has confirmed that no public parking or loading in this study area will be affected by the Proposed Scheme during construction or operation and therefore baseline conditions have not be provided.

### **Public transport**

- 5.9.30 The following sections describe the rail and local bus and coach services in the area.

#### *Rail network*

##### **Marylebone to Aylesbury Line**

- 5.9.31 The Marylebone to Aylesbury Line is a 63km railway line between London and Aylesbury, operated by Chiltern Railways. A frequent service is provided with two to four passenger trains during peak hours and two per hour at other times during the day. Services run seven days a week. Freight services also operate on this line, carrying waste from London to Calvert on the Aylesbury Link further north of the study area.
- 5.9.32 Between Harrow and Amersham, the track is shared with London Underground Metropolitan Line services. After Amersham, the line returns to NR control and runs north to Aylesbury.
- 5.9.33 Within the study area, the line runs east to west to the north of the Proposed Scheme and there is a passenger rail station at Rickmansworth (6.5km from the Proposed Scheme).

##### **Chiltern Main Line**

- 5.9.34 The Chiltern Main Line is an inter-urban, regional and commuter railway, connecting London and Birmingham by a 180km route via High Wycombe, Banbury, and Leamington Spa.

5.9.35 Within the study area the line runs east to west, to the south of the Proposed Scheme. There are passenger rail stations at Denham (1km from the Proposed Scheme) and Denham Golf Club (3km from the Proposed Scheme).

5.9.36 The West Ruislip railhead that will be used for construction of the Proposed Scheme is in close proximity to the Chiltern Main Line. There are currently two to four passenger trains during peak hours and two per hour at other times during the day. Services run seven days a week.

#### *Local bus services*

5.9.37 The following eight public bus services operate along roads that were subject to assessment:

- route 331- connecting Uxbridge to Ruislip and serving Denham, Harefield in this area;
- route 581 - connecting Beaconsfield to Uxbridge and serving Gerrards Cross and Denham;
- route 582 - Saturday only service connecting Higher Denham to Windsor and serving Iver and George Green;
- route 724 - connecting Harlow to Heathrow and serving Maple Cross, and Denham;
- route 951 - Saturday only service connecting Thorpe Park to Boreham Wood and serving Denham and Maple Cross;
- route R21 - connecting Mount Vernon Hospital to Uxbridge and serving Mill End, Maple Cross and Denham;
- route A30 - connecting Chesham to Heathrow and serving Amersham, Chalfont St Giles, Chalfont St Peter, Gerrards Cross and Denham; and
- route A40/640 - connecting High Wycombe to Heathrow Airport and serving Gerrards Cross and Denham.

5.9.38 These bus routes all operate along the A40 Oxford Road with a combined peak frequency of 10 buses per hour. Six of these routes operate along the A412 Denham Way/North Orbital Road with a combined peak frequency of six buses per hour. Two services operate along Tilehouse Lane south of Wyatt's Caravan Site with route 581 providing the weekday service at up to one bus per hour. Route 331 operates along Moorhall Road/Moorfield Road and Harvil Road with a maximum frequency of three buses per hour. Route R21 operates along Hornhill Road at up to one bus per hour.

#### *Coach services*

5.9.39 Coach services most frequently operate along the M25, M40 and A40 Western Avenue, but also operate on a less frequent basis on other roads within the study area.

### *Public transport interchanges*

- 5.9.40 Public interchanges within the study area include bus stops serving the routes listed above, along with passenger rail stations located at Denham and Denham Golf Club on the Chiltern Main Line.

### **Pedestrians, cyclists and equestrians**

- 5.9.41 The Proposed Scheme crosses five PRow and four roads with potential for use by non-motorised users in the study area.

### *Pedestrian facilities*

- 5.9.42 Notable PRow within the study area are:
- Colne Valley Trail (a 22.5km walk between Rickmansworth and Colnbrook), the Grand Union Canal Walk (a 233km walk between Little Venice in London and Birmingham) and the Hillingdon Trail (a 32km walk between Cranford Park and Springwell Lock in Greater London) which all intersect the Proposed Scheme along the Grand Union Canal, south of South Harefield;
  - South Buckinghamshire Way (a 37km walk from Coombe Hill near Wendover to the Grand Union Canal at Denham) which runs to the south of the Proposed Scheme; and
  - Old Shire Lane Circular Walk (an 13km circular walk, encompassing Chorleywood, Horn Hill, Chalfont St Peter and the wetlands of Colne Valley) which intersects the Proposed Scheme at Durdent Court and Chalfont St Peter, at the northern boundary of the Colne Valley area.
- 5.9.43 There are numerous other PRow in the area for recreational use, with some also providing connections between settlements in the area. The Baseline Survey Report in Annex B(iii) provides more details on these PRow.

### **Non-motorised user flows**

- 5.9.44 PRow surveys were undertaken in August and September 2012, to establish the nature of the PRow and their usage by non-motorised users. The surveys indicated that the majority of PRow are used by no more than 30 people per day aside from one off-road cycle route (ref: ROW/5005/0268) which is used by no more than 60 people per day.
- 5.9.45 The number of users for each PRow surveyed is provided in the Baseline Survey Report in Annex B(iii).

### *Cycle facilities*

- 5.9.46 The location of PRow that will be affected by the Proposed Scheme, which include bridleways that can be used by cyclists, is provided in the Baseline Survey Report in Annex B(iii).

- 5.9.47 The Colne Valley Trail, within Colne Valley Regional Park is an 11km off-road route linking Uxbridge with Rickmansworth. The route is shared by cyclists, pedestrian and horse riders.

#### *Equestrian facilities*

- 5.9.48 The location of PRoW that will be affected by the Proposed Scheme, which include bridleways for use by equestrians, is provided in Baseline Survey Report in Annex B(iii).

#### **Waterways/canals**

- 5.9.49 The Grand Union Canal is part of the British canal system. Its main line starts in London and ends in Birmingham, stretching for 220km. It connects to a number of locations along the Proposed Scheme, including Aylesbury, Wendover and Buckingham.
- 5.9.50 Within the study area, the canal runs north to south and intersects the Proposed Scheme when it is on viaduct, to the east of Denham Green. The majority of users of the canal are recreational users.

#### **Air transport**

- 5.9.51 No airports have been identified within the study area.



## 5.10 The Chalfonts and Amersham (CFA8)

### Study area

- 5.10.1 This section provides an overview of the baseline traffic and transport conditions for The Chalfonts and Amersham CFA. It describes the transport infrastructure within the study area, which will be affected either by the construction or the operation of the Proposed Scheme.
- 5.10.2 The Proposed Scheme through this area will be entirely in the Chiltern tunnel, which will comprise a pair of bored tunnels extending approximately 13.3km, 11.3km of which will be under the study area. The Chiltern tunnel will commence north of the M25 between junctions 16 and 17 and east of Chalfont St Peter, in the south-east.
- 5.10.3 The route will then proceed north-west passing under two sections of Chalfont St Giles located on either side of River Misbourne and then pass approximately 1km to the north of Coleshill village. It will continue to the south of Amersham Old Town through to the junction of the A413 with Mop End Lane, west of Amersham. There will be three ventilation and intervention shafts (vent shafts) in this area, near Chalfont St Peter, Chalfont St Giles and Amersham respectively.
- 5.10.4 The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFA8 Report).
- 5.10.5 The scope of the assessment has been discussed with the HA, Buckinghamshire CC and HCC.
- 5.10.6 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from south to north along the proposed route.

### Local land uses

- 5.10.7 The route of the Proposed Scheme through the study area passes through primarily agricultural land, interspersed with scattered cottages, farmsteads and villages. The topography is characteristically gently rounded as the land rises from the Colne Valley into the Chilterns Hills.
- 5.10.8 The Proposed Scheme runs in twin-bored tunnel under, or in proximity to, a number of villages and towns, including Horn Hill, Chalfont St Peter, Chalfont St Giles, Coleshill and Amersham Old Town.

## Surveys

5.10.9 Transport surveys have been undertaken to obtain baseline data in order to undertake an impact assessment of the Proposed Scheme. Traffic surveys, which in some cases included non-motorised user surveys, were undertaken in June and September 2012 and February 2013. Additionally, surveys specifically recording non-motorised users on PRoW were undertaken in August and September 2012.

5.10.10 Further details of the traffic and non-motorised user surveys and schedules for each survey undertaken are included in the Baseline Survey Report in Annex B(iii).

### *Traffic surveys*

5.10.11 Traffic surveys were undertaken to establish current traffic flows on the road network subject to assessment, during June and September 2012 and February 2013. The surveys comprised:

- automatic traffic counts (ATC) on highway links. ATC data was gathered for a continuous two week period; and
- classified turning count and queue length surveys at highway junctions. Surveys were undertaken on a weekday (Tuesday, Wednesday or Thursdays) between 07:00 and 10:00, and 16:00 and 19:00.

5.10.12 The survey data was further supplemented by traffic and transport data obtained from other sources where available, including from the HA, Buckinghamshire CC and HCC.

### *Non-motorised user surveys*

5.10.13 PRoW surveys were undertaken in August and September 2012, to establish the nature of the PRoW and their usage by pedestrians, cyclists and equestrians (non-motorised users). The surveys included all PRoW and roads that will cross the Proposed Scheme and any additional PRoW that will be affected by the Proposed Scheme.

5.10.14 The August surveys were carried out between 08:00 and 18:00 on a Sunday to capture users of footpaths, bridleways and some country lanes, where they were identified as being on a National Trail or Long Distance Route. Surveys were undertaken during the summer holidays in order to record maximum recreational usage. September surveys were carried out between 07:00 and 19:00 on a weekday (Tuesday, Wednesday or Thursdays) to capture only users of roads and associated footways. Surveys were undertaken outside of the school holidays in order to record non-recreational usage, such as school and commuting users.

## Highway network

- 5.10.15 The main strategic roads and local roads affected by the Proposed Scheme are the A413 Amersham Road/London Road East/Amersham bypass, A355 Amersham Road/Gore Hill, A404 Whielden Lane/Amersham Road, Chesham Lane, Denham Lane, Joiners Lane, Bottom House Farm Lane, Pheasant Hill, High Street (Chalfonts St Giles) and Bottrells Lane. The Proposed Scheme is in twin-bored tunnel within this area, and therefore does not cross any roads, however it passes under 11 roads.

### *Strategic road network*

#### **Primary 'A' Roads**

- 5.10.16 The A413 links Gerrards Cross with Towcester, passing through several towns in Buckinghamshire, including Buckingham, Aylesbury, Wendover and Amersham. Within the study area, the A413 Amersham Road intersects the Proposed Scheme, which is in twin-bored tunnel at that location, to the south of Amersham at Chalfont St Giles. The A413 is single carriageway within the study area.
- 5.10.17 The A355 is a single carriageway road, which connects Amersham to Beaconsfield, where it joins the A40 before continuing south to Slough. Within the study area, the A355 Amersham Road/Gore Hill intersects the Proposed Scheme, which is in twin-bored tunnel at that location, approximately 1.5km south west of Amersham.
- 5.10.18 The A404 is a single carriageway road, which connects Amersham with High Wycombe. Within the study area the A404 Whielden Lane/Amersham Road intersects the Proposed Scheme, which is in twin-bored tunnel at that location, at the southern end of Amersham Old Town.

### *Local road network*

- 5.10.19 Local roads, which are either intersected by, or impacted by the Proposed Scheme are:
- Chesham Lane/Denham Lane (two-way single carriageway);
  - Joiners Lane (two-way single carriageway);
  - Bottom House Farm Lane (single carriageway with passing places);
  - Pheasant Hill (two-way single carriageway);
  - High Street (Chalfonts St Giles) (two-way single carriageway); and
  - Bottrells Lane (two-way single carriageway).

*Baseline conditions*

- 5.10.20 2012 base year traffic volumes on the roads in the vicinity of the route have been derived from a combination of traffic surveys and traffic data obtained from other sources, where available.
- 5.10.21 The following volumes have been recorded:
- 24 hour average annual daily traffic (AADT) combined flows in number of vehicles, with proportions of heavy goods vehicles (HGVs);
  - 12 hour average annual weekday traffic (AAWT) combined flows in number of vehicles, with proportions of HGVs; and
  - AM (08:00-09:00) and PM (17:00-18:00) peak hour combined flows in number of vehicles, with proportions of HGVs.

Table 5-105: The Chalfonts and Amersham 2012 baseline flows (vehicles)

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
Strategic road network					
A413 Amersham Road (Gerrards Cross)	NB	764	15	975	9
	SB	795	65	214	31
A413 Amersham Road (Chalfont St.Giles)	NB	784	12	755	2
	SB	442	12	282	1
A355 Gore Hill/Amersham Rd (Coleshill)	NB	840	12	939	6
	SB	936	7	699	2
A413 Amersham Bypass (Amersham)	EB	1,396	80	868	33
	WB	876	80	1,529	62
A404 Whielden Lane (Amersham)	EB	874	45	602	20
	WB	733	5	915	5
A413 Amersham Road (Little Missenden)	EB	1,135	27	591	9
	WB	659	12	1,195	20
Local road network					
Joiners Lane (Chalfont St Peter)	EB	250	1	275	0
	WB	409	2	168	0
Chesham Lane/Denham Lane (Chalfont St Peter)	NB	120	1	139	0
	SB	174	0	72	1
Bottom House Farm Lane (Chalfont St	EB	2	0	2	0

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
Giles)	WB	2	0	1	0
High Sreet/Pheasant Hill (Chalfont St Giles)	NB	412	3	408	6
	SB	553	3	380	1
Silver Hill (Chalfont St Giles)	EB	66	1	96	0
	WB	101	0	59	0
Bottrells Lane (Chalfont St Giles)	EB	15	0	13	0
	WB	42	0	13	0

- 5.10.22 Further information on 2012 baseline traffic data is provided in the Baseline Survey Report in Annex B(iii).

### Accidents and safety

- 5.10.23 Relevant accident data for the road network subject to assessment has been obtained from Buckinghamshire CC and HCC for the three year period of 2009 to 2011 and from HA for the five year period of 2007 to 2011.
- 5.10.24 The accident data has been interrogated and any clusters of nine or more accidents over a three year period, within 20m of a junction or within 150m on any sections of road between junctions, have been identified. No such accident clusters have been identified in the area.

### Parking and loading

- 5.10.25 Locations where existing public parking and loading will be potentially affected by the Proposed Scheme have been established from site observations and desktop review. This has confirmed that no public parking or loading in this study area will be affected by the Proposed Scheme during construction or operation and therefore baseline conditions have not be provided.

### Public transport

- 5.10.26 The following sections describe rail and local bus and coach services in the area.

### *Rail network*

#### **Marylebone to Aylesbury Line**

- 5.10.27 The Marylebone to Aylesbury Line is a 63km railway line between London and Aylesbury, operated by Chiltern Railways. A frequent service is provided with two to four passenger trains during peak hours and two per hour at other times during the day. Services run seven days a week. Freight services also operate on this line, carrying waste from London to Calvert on the Aylesbury Link.
- 5.10.28 Between Harrow and Amersham, the track is shared with London Underground Metropolitan Line services. After Amersham, the line returns to NR control and runs north to Aylesbury.
- 5.10.29 Within the study area, the line runs to the north of the Proposed Scheme. There are passenger rail stations at Amersham (2km from the Proposed Scheme), Chalfont and Latimer (2km from the Proposed Scheme) and Chorleywood (4km from the Proposed Scheme).

#### **Chiltern Main Line**

- 5.10.30 The Chiltern Main Line is an inter-urban, regional and commuter railway, connecting London and Birmingham by a 180km route via High Wycombe, Banbury, and Leamington Spa. There are currently two to four passenger trains during peak hours and two per hour at other times during the day. Services run seven days a week.
- 5.10.31 Within the study area, the line runs east to west to the south of the Proposed Scheme. There are passenger rail stations at Gerrard's Cross (3.5km from the Proposed Scheme), Seer Green (3.5km from the Proposed Scheme), Beaconsfield (6km from the Proposed Scheme) and High Wycombe (8km from the Proposed Scheme).

### *Local bus services*

- 5.10.32 The following 11 public bus services operate along roads that were subject to assessment:
- route 1 – connecting High Wycombe to Codmore Cross and serving Hazelmere, Holmer Green and Amersham;
  - route 36c – connecting Chesham to Bourne End and serving Chesham Bois, Amersham, Holmer Green, Hazlemere, High Wycombe, and Flackwell Heath;
  - route 52 – connecting High Wycombe to Chesham and serving Hazelmere, Holmer Green, Amersham, and Chesham Bois;
  - route 72 – connecting Penn Street to Amersham and serving Winchmore Hill;
  - route 177 – connecting Chesham to Great Missenden and serving Chartridge, Ballinger Common and South Heath;



- route 73 – connecting Ley Hill to Coleshill and serving Chesham, Chesham Bois, and Amersham;
- route 336/X336 – connecting High Wycombe to Watford and serving Beaconsfield, Amersham, Little Chalfont, Chorleywood, Rickmansworth, and Croxley Green;
- route 580 – connecting High Wycombe to Uxbridge and serving Loudwater, Wooburn Moor, Beaconsfield, Seer Green, Chalfont St Giles, Chalfont St Peter, Gerrards Cross, and Denham;
- route 335 – connecting Chalfont Common to Slough and serving Chalfont St Peter, Gerrards Cross, Wexham, and George Green;
- route 353 – connecting Sough to Hemel Hempstead and serving Stoke Poges, Gerrard's Cross, Chalfont St Peter, Chalfont St Giles, Amersham, Chesham Bois, Chesham, Lye Green, Whelpley Hill, Bovingdon, and Felden; and
- route A30 – connecting Chesham to Uxbridge and serving Chesham Bois, Amersham, Chalfont St Giles, Chalfont St Peter, Gerrards Cross, and Denham.

5.10.33 Four of these services operate along A404 Whielden Lane, with a combined peak frequency of up to six buses an hour, with Route 52 being a Sunday only service. Three of these services operate along the A413 Amersham bypass with a combined peak frequency of up to three buses an hour. Two of these services operate along the A355 Amersham Road/Gore Hill, with a combined peak frequency of up to two buses an hour. Four of these services operate along the A413 Gravel Hill/Amersham Road through Chalfont St Peter, with a combined peak frequency of up to four buses an hour. Route 355 operates along Chesham Lane, at a peak frequency of one bus an hour.

### *Coach services*

- 5.10.34 Coach services most frequently operate along Primary A roads, but also operate on a less frequent basis on other roads within the study area.
- 5.10.35 The National Express Coach service 737 from Oxford to Stansted Airport stops in Hemel Hempstead and High Wycombe, less than 16km from the Proposed Scheme. This operates hourly seven days per week.

### *Public transport interchanges*

- 5.10.36 Public interchanges within the study area include bus stops serving the routes listed above, along with passenger rail stations located at Amersham, Chalfont and Latimer and Chorleywood on the Marylebone to Aylesbury Line and at Gerrard's Cross, Seer Green, Beaconsfield and High Wycombe on the Chiltern Main Line.

## **Pedestrians, cyclists and equestrians**

5.10.37 The Proposed Scheme is in bored tunnel within this study area, as such it goes under 15 PRow and 11 roads.

### *Pedestrian facilities*

5.10.38 Notable PRow within the study area are:

- South Buckinghamshire Way (a 37km walk from Coombe Hill near Wendover to the Grand Union Canal at Denham) which intersects the Proposed Scheme at Chalfont St Giles and Amersham;
- The Chiltern Way (a 277km long-distance circular route through the Chiltern Hills and passing through parts of Bedfordshire, Buckinghamshire, Hertfordshire and Oxfordshire) which intersects the Proposed Scheme at Chalfont St Giles twice and Chalfont St Peter once; and
- Old Shire Lane Circular Walk (an 13km circular walk, encompassing Chorleywood, Hornhill, Chalfont St Peter and the wetlands of Colne Valley) which intersects the Proposed Scheme at Chalfont St Peter, at the southernmost boundary of the study area.

5.10.39 There are numerous other PRow in the area for recreational use, with some also providing connections between settlements in the area. The Baseline Survey Report in Annex B(iii) provides more details on these PRow.

### **Non-motorised user flows**

5.10.40 PRow surveys were undertaken in August and September 2012, to establish the nature of the PRow and their usage by non-motorised users. The surveys included all PRow and roads that will cross the Proposed Scheme, and any additional PRow that will be affected by the Proposed Scheme.

5.10.41 The surveys indicated that the majority of PRow are used by no more than 20 people per day apart from Chalfont Lane and public footpath CSG/28/4, which are used by no more than 40 and 70 people per day respectively.

5.10.42 The number of users for each PRow surveyed is provided in the Baseline Survey Report in Annex B(iii).

### *Cycle facilities*

5.10.43 The location of PRow that will be affected by the Proposed Scheme, which include bridleways that can be used by cyclists, is provided in the Baseline Survey Report in Annex B(iii).

5.10.44 The Milton Route, on the National Cycle Network and part of the Chiltern Heritage Trail, is a 40km circular cycle route starting and finishing at Amersham. It runs on both minor road carriageway and traffic-free path on footway. The circular route passes around Winchmore Hill, Seer Green, Chalfont St Giles, Chalfont St. Peter, Chalfont Common and Little Chalfont.

### *Equestrian facilities*

- 5.10.45 The location of PRow that will be affected by the Proposed Scheme, which include bridleways for use by equestrians, is provided in the Baseline Survey Report in Annex B(iii).

### **Waterways/ canals**

- 5.10.46 No waterways or canals frequently used by waterborne craft and affected by the Proposed Scheme have been identified within the study area.

### **Air transport**

- 5.10.47 No airports have been identified within the study area.

## **5.11 Central Chilterns (CFAg)**

### **Study area**

- 5.11.1 This section provides an overview of the baseline traffic and transport conditions for the Central Chilterns CFA. It describes the transport infrastructure within the study area, which will be affected either by the construction or the operation of the Proposed Scheme.
- 5.11.2 The Proposed Scheme will enter the area in twin-bored tunnel underneath the A413 junction with Mop End Lane, in a south east to north-west direction. A ventilation and intervention shaft (vent shaft) and adjacent auto-transformer station will be to the north of the A413 at Little Missenden.
- 5.11.3 Emerging from the twin-bored tunnel west of Hyde Heath, the route will run in cutting to the west of Hyde Heath then enter a 1.2km long green tunnel past South Heath. The route will then run in cutting to Leather Lane, to the west of Ballinger Common, where the route will leave this area.
- 5.11.4 The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFAg Report).
- 5.11.5 The scope of the assessment has been discussed with Buckinghamshire CC.
- 5.11.6 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from south to north along the proposed route.

### **Local land uses**

- 5.11.7 The route of the Proposed Scheme through the study area passes through predominantly rural land, consisting of mixed agricultural land, woodland and villages. The Proposed Scheme in this area lies entirely in the Chilterns Area of Outstanding Natural Beauty (AONB).
- 5.11.8 The town of Chesham lies to the north-east of the Proposed Scheme and the town of High Wycombe lies to the south-west. Villages in proximity to the Proposed Scheme include Little Missenden, Great Missenden, Little Kingshill, Hyde Heath and South Heath.

### **Surveys**

- 5.11.9 Transport surveys have been undertaken to obtain baseline data in order to undertake an impact assessment of the Proposed Scheme. Traffic surveys, which in some cases included non-motorised user surveys, were undertaken in September 2012 and February 2013. Additionally, surveys specifically recording non-motorised users on PRow were undertaken in August and September 2012.

- 5.11.10 Further details of the traffic and non-motorised user surveys and schedules for each survey undertaken are included in the Baseline Survey Report in Annex B(iii).

### *Traffic surveys*

- 5.11.11 Traffic surveys were undertaken to establish current traffic flows on the road network subject to assessment, during September 2012 and February 2013. The surveys comprised:
- automatic traffic counts (ATC) on highway links. ATC data was gathered for a continuous two week period; and
  - classified turning count and queue length surveys at highway junctions. Surveys were undertaken on a weekday (Tuesday, Wednesday or Thursdays) between 07:00 and 10:00, and 16:00 and 19:00.
- 5.11.12 The survey data was further supplemented by traffic and transport data obtained from other sources where available, including from Buckinghamshire CC.

### *Non-motorised user surveys*

- 5.11.13 PRoW surveys were undertaken in August and September 2012, to establish the nature of the PRoW and their usage by pedestrians, cyclists and equestrians (non-motorised users). The surveys included all PRoW and roads that will cross the Proposed Scheme and any additional PRoW that will be affected by the Proposed Scheme.
- 5.11.14 The August surveys were carried out between 08:00 and 18:00 on a Sunday to capture users of footpaths, bridleways and some country lanes, where they were identified as being on a National Trail or Long Distance Route. Surveys were undertaken during the summer holidays in order to record maximum recreational usage. September surveys were carried out between 07:00 and 19:00 on a weekday (Tuesday, Wednesday or Thursdays) to capture only users of roads and associated footways. Surveys were undertaken outside of the school holidays in order to record non-recreational usage, such as school and commuting users.

### **Highway network**

- 5.11.15 The main strategic roads and local roads affected by the Proposed Scheme are A413/A413 London Road, B485 Chesham Road, King's Lane, Frith Hill, Hyde Heath Road, Hyde Lane, Potter Row and Leather Lane. The Proposed Scheme, some of which is in twin-bored tunnel in this area is routed under seven roads within the study area.

### *Strategic road network*

#### **Primary 'A' Roads**

- 5.11.16 The A413 links Gerrards Cross with Towcester, passing through several towns in Buckinghamshire, including Buckingham, Aylesbury, Wendover and Amersham. Within the study area, the A413 intersects the Proposed Scheme, which is in twin-bored tunnel at that location, to the north of Amersham, at Little Missenden. The A413 is single carriageway within the study area.

### *Local road network*

- 5.11.17 Local roads, which are either intersected by, or impacted by the Proposed Scheme are:
- B485 Chesham Road (two-way single carriageway, from Prestwood to Chesham. The B485 Chesham Road intersects the Proposed Scheme, which is in green tunnel at that location, south of South Heath);
  - King's Lane (two-way single carriageway);
  - Frith Hill (two-way single carriageway);
  - Hyde Heath Road (two-way single carriageway);
  - Hyde Lane (single carriageway with passing places);
  - Potter Row (two-way single carriageway); and
  - Leather Lane (single carriageway with passing places).

### *Baseline conditions*

- 5.11.18 2012 base year traffic volumes on the roads subject to assessment have been derived from a combination of traffic surveys and traffic data obtained from other sources, where available.
- 5.11.19 The following volumes have been recorded:
- 24 hour average annual daily traffic (AADT) combined flows in number of vehicles, with proportions of heavy goods vehicles (HGVs);
  - 12 hour average annual weekday traffic (AAWT) combined flows in number of vehicles, with proportions of HGVs; and
  - AM (08:00-09:00) and PM (17:00-18:00) peak hour combined flows in number of vehicles, with proportions of HGVs.



Table 5-106: Central Chilterns 2012 baseline flows (vehicles)

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
Strategic road network					
A413 Amersham Road ( Little Missenden)	EB	1,135	27	591	9
	WB	659	12	1,195	20
A413 Missenden Bypass (South of B485) (Great Missenden)	NB	745	25	1,002	15
	SB	1,293	52	712	5
A413 Missenden Bypass (North of B485) (Great Missenden)	NB	661	19	1,039	16
	SB	1,105	45	648	4
B485 Chesham Road (east of King's Lane, South Heath)	EB	599	4	359	1
	WB	386	5	508	1
B485 Chesham Road/Frith Hill (west of King's Lane, South Heath)	EB	521	12	367	4
	WB	393	27	503	4
Local road network					
Hyde Lane (South Heath)	NB	6	0	5	0
	SB	9	0	6	0
King’s Lane (south of Frith Hill, South Heath)	NB	40	0	66	0
	SB	98	1	32	0
Frith Hill (South Heath)	EB	71	0	101	0
	WB	134	0	64	0
Hyde Heath Road (South Heath)	NB	106	0	147	0
	SB	223	2	108	0
Potter Row (South Heath)	EB	40	1	20	0
	WB	31	1	33	0
Leather Lane (South Heath)	EB	27	0	24	0
	WB	34	0	15	0

- 5.11.20 Further information on 2012 baseline traffic data is provided in the Baseline Survey Report in Annex B(iii).

### Accidents and safety

- 5.11.21 Relevant accident data for the road network subject to assessment has been obtained from Buckinghamshire CC for the three year period of 2009 to 2011.

- 5.11.22 The accident data has been interrogated and any clusters of nine or more accidents over a three year period, within 20m of a junction or within 150m on any sections of road between junctions, have been identified. No such accident clusters have been identified in the area.

### **Parking and loading**

- 5.11.23 Locations where existing public parking and loading will be potentially affected by the Proposed Scheme have been established from site observations and desktop review. This has confirmed that no public parking or loading in this study area will be affected by the Proposed Scheme during construction or operation and therefore baseline conditions have not be provided.

### **Public transport**

- 5.11.24 The following sections describe rail and local bus and coach services in the area.

#### *Rail network*

##### **Marylebone to Aylesbury Line**

- 5.11.25 The Marylebone to Aylesbury Line is a 63km railway line between London and Aylesbury, operated by Chiltern Railways. A frequent service is provided with two to four passenger trains during peak hours and two per hour at other times during the day. Services run seven days a week. Freight services also operate on this line, carrying waste from London to Calvert on the Aylesbury Link.
- 5.11.26 Within the study area, the line intersects the Proposed Scheme at Great Missenden, where the Proposed Scheme is in twin-bored tunnel. A passenger rail station is located in Great Missenden, 0.8km from the Proposed Scheme. The line then continues to run parallel and to the west of the Proposed Scheme towards Wendover.

#### *Local bus services*

- 5.11.27 The following three bus services operate along roads that were subject to assessment:
- route 55 – connecting Aylesbury to Amersham and serving Stoke Mandeville, Wendover, Great Missenden, Chesham, and Chesham Bois;
  - route 190 – connecting Chesham to Amersham and serving Chesham Bois and Hyde Heath; and
  - route 177 – connecting Chesham to Great Missenden and serving Chartridge, Ballinger Common, and South Heath.

- 5.11.28 Route 55 operates along the A413 through Great Missenden, Route 190 operates along the B485 at a peak frequency of up to one bus an hour, and Route 177 operates along Frith Hill, all at a peak frequency of up to one bus an hour.

### *Coach services*

- 5.11.29 Coach services most frequently operate along Primary A roads, but also operate on a less frequent basis on other roads within the study area.
- 5.11.30 The National Express Coach service 737 from Oxford-High Wycombe-Luton Airport-Stansted Airport stops in Hemel Hempstead and High Wycombe, and intersects the Proposed Scheme south of Hyde Heath. This service operates hourly seven days per week.

### *Public transport interchanges*

- 5.11.31 Public interchanges within the study area include bus stops serving the routes listed above, along with a passenger rail station located at Great Missenden on the Marylebone to Aylesbury Line.

### **Pedestrians, cyclists and equestrians**

- 5.11.32 PRoW provide links between settlements within the study area. The Proposed Scheme, some of which is within twin-bored tunnel in this area, crosses or goes under PRoW in 13 locations.

### *Pedestrian facilities*

- 5.11.33 Notable PRoW within the study area are:
- South Buckinghamshire Way (a 37km walk between Coombe Hill near Wendover and the Grand Union Canal at Denham) which runs to the west of the Proposed Scheme; and
  - The Chiltern Link (a 13km walk between Wendover and Chesham) which runs to the east of the Proposed Scheme.
- 5.11.34 There are numerous other PRoW in the area for recreational use, with some also providing connections between settlements in the area. The Baseline Survey Report in Annex B(iii) provides more details on these PRoW.

### **Non-motorised user flows**

- 5.11.35 PRoW surveys were undertaken in August and September 2012, to establish the nature of the PRoW and their usage by non-motorised users. The surveys included all PRoW and roads that will cross the Proposed Scheme, and any additional PRoW that will be affected by the Proposed Scheme.
- 5.11.36 The surveys indicated that the majority of PRoW crossing the route are used by no more than 40 people per day, apart from GMI/12/1 (footpath) and GMI/13/3 (footpath) which were used by no more than 70 people per day.

- 5.11.37 The number of users for each PRow surveyed is provided in the Baseline Survey Report in Annex B(iii).

### *Cycle facilities*

- 5.11.38 The location of PRow that will be affected by the Proposed Scheme, which include bridleways that can be used by cyclists, is provided in the Baseline Survey Report in Annex B(iii).
- 5.11.39 The Chilterns Cycleway, on the National Cycle Network, is a 278km circular cycle route passing through Buckinghamshire, Oxfordshire, Bedfordshire and Hertfordshire, mainly on-road and is signposted throughout. It intersects the Proposed Scheme within the study area at Hyde Heath (Hampden Route).
- 5.11.40 National Route 57, on the National Cycle Network, runs from Thame to Chesham. The route follows the Phoenix Trail (a 10km traffic free route on a former railway line) as far as Princes Risborough. From Princes Risborough the route climbs the Chilterns along country lanes through Great Missenden, before arriving at the market town of Chesham.
- 5.11.41 Regional Route 3 runs on minor roads and connects villages including Ballinger Common, Lee Common and South Heath.

### *Equestrian facilities*

- 5.11.42 The location of PRow that will be affected by the Proposed Scheme, which include bridleways for use by equestrians, is provided in the Baseline Survey Report in Annex B(iii).

### **Waterways/ canals**

- 5.11.43 No waterways or canals frequently used by waterborne craft and affected by the Proposed Scheme have been identified within the study area.

### **Air transport**

- 5.11.44 No airports have been identified within the study area.

## 5.12 Dunsmore, Wendover and Halton (CFA10)

### Study area

- 5.12.1 This section provides an overview of the baseline traffic and transport conditions for the Dunsmore, Wendover and Halton CFA. It describes the transport infrastructure within the study area, which would be affected either by the construction or the operation of the Proposed Scheme.
- 5.12.2 The Proposed Scheme through this area will be approximately 8km in length. It will commence in cutting at the Leather Lane overbridge, north of Great Missenden, and will proceed north-westwards onto a viaduct to the north-east of Wendover Dean. It will pass to the east of Dunsmore on a series of embankments and cuttings, before crossing over the A413 London Road on a viaduct at Small Dean. It will then run parallel to the A413 and the Marylebone to Aylesbury Line in twin-bored tunnel, emerging into a cutting just beyond the western edge of Wendover. It will leave the study area on embankment.
- 5.12.3 The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFA10 Report).
- 5.12.4 The scope of this work has been discussed with Buckinghamshire CC.
- 5.12.5 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from south to north along the proposed route.

### Local land uses

- 5.12.6 The route of the Proposed Scheme through the study area passes through predominantly rural land, consisting of agricultural land, woodland, villages and isolated farmsteads. Approximately 7km of the Proposed Scheme in this section lies within the Chilterns AONB (from Leather Lane to the north of Wendover) and the route will cross the Chiltern Hills.
- 5.12.7 At the southern end of the study area, the route will pass within 1km of the villages Hunt's Green and King's Ash (which lie to the east of the Proposed Scheme) and Wendover Dean (which lies to the west). The route will continue towards Wendover, with Dunsmore Village approximately 1.6km west. The Proposed Scheme will run along the south-western edge of Wendover, the largest settlement in the area.

### Surveys

- 5.12.8 Transport surveys have been undertaken to obtain baseline data in order to undertake an impact assessment of the Proposed Scheme. Traffic surveys, which in some cases included non-motorised user surveys, were undertaken in September 2012 and February 2013. Additionally, surveys specifically recording non-motorised users on PRoW were undertaken in August and September 2012.

- 5.12.9 Further details of the traffic and non-motorised user surveys and schedules for each survey undertaken are included in the Baseline Survey Report in Annex B(iii).

### *Traffic surveys*

- 5.12.10 Traffic surveys were undertaken to establish current traffic flows on the road network subject to assessment, during September 2012 and February 2013. The surveys comprised:
- automatic traffic counts (ATC) on highway links. ATC data was gathered for a continuous two week period; and
  - classified turning count and queue length surveys at highway junctions. Surveys were undertaken on a weekday (Tuesday, Wednesday or Thursdays) between 07:00-10:00, and 16:00-19:00.
- 5.12.11 The survey data was further supplemented by traffic and transport data obtained from other sources where available, including from Buckinghamshire CC.

### *Non-motorised user surveys*

- 5.12.12 PRoW surveys were undertaken in August and September 2012, to establish the nature of the PRoW and their usage by pedestrians, cyclists and equestrians (non-motorised users). The surveys included all PRoW and roads that will cross the Proposed Scheme and any additional PRoW that will be affected by the Proposed Scheme.
- 5.12.13 The August surveys were carried out between 08:00 and 18:00 on a Sunday to capture users of footpaths, bridleways and some country lanes, where they were identified as being on a National Trail or Long Distance Route. Surveys were undertaken during the summer holidays in order to record maximum recreational usage. September surveys were carried out between 07:00 and 19:00 on a weekday (Tuesday, Wednesday or Thursdays) to capture only users of roads and associated footways. Surveys were undertaken outside of the school holidays in order to record non-recreational usage, such as school and commuting users.

### *Highway network*

- 5.12.14 The main strategic roads and local roads affected by the Proposed Scheme are A413 London Road/Nash Lee Road, A4010 Risborough Road, B4009 Nash Lee Road, Small Dean Lane, Rocky Lane (also known as Rocky Lane), Bowood Lane, Bacombe Lane, Nash Lee Lane, North Lee Lane, and South Street, and Pond Street/Ellesborough Road. The Proposed Scheme crosses eight roads within the study area.



## *Strategic road network*

### **Primary 'A' Roads**

- 5.12.15 The A413 links Gerrards Cross with Towcester, passing through several towns in Buckinghamshire, including Buckingham, Aylesbury, Wendover and Amersham. Within the study area, the A413 loosely follows the line of the Marylebone to Aylesbury Line, approximately 1.5km to the west of the Proposed Scheme. The A413 London Road intersects the Proposed Scheme 1km south of Wendover. The east/west running Ellesborough Road/Pound Street bridges the A413 Nash Lee Road to the west of Wendover. Immediately to the north, a footbridge provides access over the A413 Nash Lee Road for Wendover rail station, which is located adjacent to the southbound carriageway.
- 5.12.16 The A4010 is a north-south road running from High Wycombe at junction 4 of the M40 motorway to Stoke Mandeville, near Aylesbury. Within the study area, the A4010 Risborough Road runs to the west of the Proposed Scheme.

## *Local road network*

- 5.12.17 Local roads, which are either intersected by, or impacted by the Proposed Scheme are:
- B4009 Nash Lee Road (two-way single carriageway, between the A4010 Risborough Road and A413 London Road south of Stoke Mandeville, which intersects the Proposed Scheme immediately north of Wendover;
  - Small Dean Lane (single carriageway with passing places);
  - Rocky Lane (two-way single carriageway);
  - Bowood Lane (single carriageway with passing places);
  - Bacombe Lane (single carriageway with passing places);
  - Nash Lee Lane (two-way single carriageway);
  - North Lee Lane and South Street (two-way single carriageway);
  - Pound Street (two-way single carriageway); and
  - Ellesborough Road (two-way single carriageway).

## *Baseline conditions*

- 5.12.18 2012 base year traffic volumes on the roads subject to assessment have been derived from a combination of traffic surveys and traffic data obtained from other sources, where available.
- 5.12.19 The following volumes have been recorded:
- 24 hour average annual daily traffic (AADT) combined flows in number of vehicles, with proportions of heavy goods vehicles (HGVs);

- 12 hour average annual weekday traffic (AAWT) combined flows in number of vehicles, with proportions of HGVs; and
- AM (08:00-09:00) and PM (17:00-18:00) peak hour combined flows in number of vehicles, with proportions of HGVs.

Table 5-107: Dunsmore, Wendover and Halton 2012 baseline flows (vehicles)

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
Strategic road network					
A413 London Road (south of Small Dean Lane) (Wendover)	NB	749	9	1232	6
	SB	1,156	21	776	5
A413 London Road (south of Dunsmore Lane) (Wendover)	NB	749	9	1,232	6
	SB	1,156	21	776	5
A413 Nash Lee Road (Wendover)	NB	604	21	901	10
	SB	808	26	565	12
A413 Wendover Bypass (Wendover)	NB	690	32	1,061	16
	SB	876	39	681	11
A4010 Aylesbury Rd/ Risborough Rd (Little Kimble)	EB	679	7	582	2
	WB	767	8	467	2
A4010 Risborough Rd (Stoke Mandeville)	NB	724	27	947	16
	SB	844	28	685	7
B4009 Nash Lee Rd (Wendover)	EB	519	8	192	5
	WB	584	5	366	2
Local road network					
Leather Lane (South Heath)	EB	27	0	24	0
	WB	34	0	15	0
Bowood Lane (Wendover Dean)	NB	0	0	0	0
	SB	0	0	1	0
King's Lane (Kingsash)	NB	1	0	1	0
	SB	2	0	1	0
Rocky Lane (Kingsash)	NB	77	0	67	0
	SB	63	0	48	0
Dunsmore Lane (Wendover)	EB	17	1	16	0
	WB	14	0	14	1

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
Small Dean Lane (Wendover)	NB	2	0	8	0
	SB	3	0	8	0
London Road/ South Street (Wendover)	NB	220	1	382	1
	SB	380	1	235	1
Bacombe Lane (Wendover)	EB	6	0	3	0
	WB	4	0	6	0
Ellesborough Road/ Pound Street (Wendover)	EB	227	1	320	1
	WB	342	8	233	6
Nash Lee Lane (Wendover)	NB	8	0	13	0
	SB	14	0	9	0
North Lee Lane (Stoke Mandeville)	NB	69	0	69	0
	SB	88	1	54	0

- 5.12.20 Further information on 2012 baseline traffic data is provided in the Baseline Survey Report in Annex B(iii).

### Accidents and safety

- 5.12.21 Relevant accident data for the road network subject to assessment has been obtained from Buckinghamshire CC for the three year period of 2009 to 2011.
- 5.12.22 The accident data has been interrogated and any clusters of nine or more accidents over a three year period, within 20m of a junction or within 150m on any sections of road between junctions, have been identified. No such accident clusters have been identified in the area.

### Parking and loading

- 5.12.23 Locations where existing public parking and loading will be potentially affected by the Proposed Scheme have been established from site observations and desktop review. This has confirmed that no public parking or loading in this study area will be affected by the Proposed Scheme during construction or operation and therefore baseline conditions have not be provided.

### Public transport

- 5.12.24 The following sections describe the rail, bus and coach services in the area.

### *Rail network*

#### **Marylebone to Aylesbury Line**

- 5.12.25 The Marylebone to Aylesbury Line is a 63km railway line between London and Aylesbury, operated by Chiltern Railways. A frequent service is provided with two to four passenger trains during peak hours and two per hour at other times during the day. Services run seven days a week. Freight services also operate on this line.
- 5.12.26 Within the study area, the line runs to the west of the Proposed Scheme, before intersecting south of Wendover, where the route is on viaduct at Small Dean. The line then continues to run parallel to the Proposed Scheme to a passenger rail station at Wendover, before continuing north.

### *Local bus services*

- 5.12.27 The following three bus services operate along roads that were subject to assessment:
- route 55 – connecting Aylesbury to Amersham and serving Stoke Mandeville, Wendover, Great Missenden, Chesham, and Chesham Bois;
  - route 21A – connecting St Bernards School to Aylesbury and serving Stoke Mandeville and Princes Risborough; and
  - route 300 – connecting Aylesbury to High Wycombe and serving Stoke Mandeville, Princes Risborough, Lacey Green, Walters Ash, Naphill, and Hughenden Valley.
- 5.12.28 Two of these services operate along the B4009 Nash Lee Road, with a combined peak frequency of up to four buses an hour. Route 55 operates along the A413 London Road at a peak frequency of up to one bus an hour.

### *Coach services*

- 5.12.29 Coach services most frequently operate along Primary A roads, but also operate on a less frequent basis on other roads within the study area.

### *Public transport interchanges*

- 5.12.30 Public interchanges within the study area include bus stops serving the routes listed above, along with a passenger rail station located at Wendover on the Marylebone to Aylesbury Line.

### **Pedestrians, cyclists and equestrians**

- 5.12.31 PRoW provide links between settlements within the study area. The Proposed Scheme crosses PRoW in 14 locations within the study area.

### *Pedestrian facilities*

- 5.12.32 Notable recreational routes within the study area are:

- The Chiltern Way (a 277km long-distance circular route through the Chiltern Hills and passing through parts of Bedfordshire, Buckinghamshire, Hertfordshire and Oxfordshire) which intersects the Proposed Scheme to the east of Wendover Dean;
- The Chiltern Link (an 13km walk between Wendover and Chesham) which runs to the east of the Proposed Scheme;
- The South Buckinghamshire Way (a 37km walk between Coombe Hill near Wendover and the Grand Union Canal at Denham) and the Aylesbury Ring (a 51km circular route around Aylesbury, passing around Wendover) which both intersect the Proposed Scheme to the south of Wendover; and
- The Ridgeway National Trail, which is one of 15 National Trails in England and Wales. It is 140km long and intersects the Proposed Scheme at Wendover.

There are numerous other PRoW in the area for recreational use, with some also providing connections between settlements in the area. The Baseline Survey Report in Annex B(iii) provides more details on these PRoW.

### **Non-motorised user flows**

- 5.12.33 All PRoW that will be intersected by the Proposed Scheme have been surveyed, taking account of the nature of the PRoW and their usage. As appropriate, these surveys covered weekday and weekend use.
- 5.12.34 The surveys indicated that the majority of roads, footpaths, bridleways and cycleways crossing the route were used by no more than 40 people per day apart from a crossing on Ellesborough Road, which was used by no more than 120 people per day.
- 5.12.35 The number of users for each PRoW surveyed is provided in the Baseline Survey Report in Annex B(iii).

### *Cycle facilities*

- 5.12.36 The location of PRoW that will be affected by the Proposed Scheme, which include bridleways that can be used by cyclists, is provided in the Baseline Survey Report in Annex B(iii).
- 5.12.37 The Chilterns Cycleway, on the National Cycle Network, is a 278km circular cycle route passing through Buckinghamshire, Oxfordshire, Bedfordshire and Hertfordshire, mainly on-road and is signposted throughout. Within the study area it intersects the Proposed Scheme at Wendover Dean (The Icknield Way).

### *Equestrian facilities*

- 5.12.38 The location of PRoW that will be affected by the Proposed Scheme, which include bridleways for use by equestrians, is provided in the Baseline Survey Report in Annex B(iii).

### **Waterways/ canals**

- 5.12.39 No waterways or canals frequently used by waterborne craft and affected by the Proposed Scheme have been identified within the study area.

### **Air transport**

- 5.12.40 No airports have been identified within the study area.



## 5.13 Stoke Mandeville and Aylesbury (CFA11)

### Study area

- 5.13.1 This section provides an overview of the baseline traffic and transport conditions for the Stoke Mandeville and Aylesbury CFA. It describes the transport infrastructure within the study area, which would be affected either by the construction or the operation of the Proposed Scheme.
- 5.13.2 Within the study area, the Proposed Scheme will be approximately 10.5km in length. The route will commence just north of Nash Lee and continue north-west under Risborough Road, Marsh Lane and the Princes Risborough to Aylesbury Line.
- 5.13.3 The route will pass to the west of Stoke Mandeville and Aylesbury, passing under the A418 Oxford Road, and will then proceed to the east of Hartwell House. It will cross the River Thame to the east of Waddesdon, heading north-west across the Aylesbury Vale to exit the area south of the A41 Bicester Road.
- 5.13.4 The area is predominantly rural land, consisting of mixed agricultural land. The Proposed Scheme will pass approximately 270m from the southern tip of Stoke Mandeville and then approximately 200m from the southern edge of Aylesbury. The route will pass within 1.1km of Bishopstone, 1km of Stone, and within 800m and 330m of Upper and Lower Hartwell respectively. These villages lie to the south of the Proposed Scheme.
- 5.13.5 The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFA11 Report).
- 5.13.6 The scope of this work has been discussed with Buckinghamshire CC.
- 5.13.7 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from south to north along the proposed route.

### Local land uses

- 5.13.8 The route of the Proposed Scheme through the study area passes through predominantly rural land, consisting of mixed agricultural land. The area is typified by scattered farmsteads and villages.
- 5.13.9 The Proposed Scheme will pass approximately 270m from the southern tip of Stoke Mandeville and then approximately 200m from the southern edge of Aylesbury. The route will pass within 1.1km of Bishopstone, 1km of Stone, and within 800m and 330m of Upper and Lower Hartwell respectively. These villages lie to the south of the Proposed Scheme.

## Surveys

5.13.10 Transport surveys have been undertaken to obtain baseline data in order to undertake an impact assessment of the Proposed Scheme. Traffic surveys, which in some cases included non-motorised user surveys, were undertaken in September 2012 and February 2013. Additionally, surveys specifically recording non-motorised users on PRoW were undertaken in August and September 2012.

5.13.11 Further details of the traffic and non-motorised user surveys and schedules for each survey undertaken are included in the Baseline Survey Report in Annex B(iii).

### *Traffic surveys*

5.13.12 Traffic surveys were undertaken to establish current traffic flows on the road network subject to assessment, during September 2012 and February 2013. The surveys comprised:

- automatic traffic counts (ATC) on highway links. ATC data was gathered for a continuous two week period; and
- classified turning count and queue length surveys at highway junctions. Surveys were undertaken on a weekday (Tuesday, Wednesday or Thursdays) between 07:00 and 10:00, and 16:00 and 19:00.

5.13.13 The survey data was further supplemented by traffic and transport data obtained from other sources where available, including from Buckinghamshire CC.

### *Non-motorised user surveys*

5.13.14 PRoW surveys were undertaken in August and September 2012, to establish the nature of the PRoW and their usage by pedestrians, cyclists and equestrians (non-motorised users). The surveys included all PRoW and roads that will cross the Proposed Scheme and any additional PRoW that will be affected by the Proposed Scheme.

5.13.15 The August surveys were carried out between 08:00 and 18:00 on a Sunday to capture users of footpaths, bridleways and some country lanes, where they were identified as being on a National Trail or Long Distance Route. Surveys were undertaken during the summer holidays in order to record maximum recreational usage. September surveys were carried out between 07:00 and 19:00 on a weekday (Tuesday, Wednesday or Thursdays) to capture only users of roads and associated footways. Surveys were undertaken outside of the school holidays in order to record non-recreational usage, such as school and commuting users.

## Highway network

- 5.13.16 The main strategic roads and local roads that will be affected by the Proposed Scheme are the A41 Bicester Road, A413 Wendover Road/Nash Lee Road, A4010 Risborough Road/Station Road, A418 Aylesbury Road/Oxford Road, A4157 Weedon Road/Elmhurst Road, B4009 Nash Lee Road, B4443 Lower Road, Old Risborough Road, Marsh Lane and Nash Lee Lane. The Proposed Scheme crosses four roads within the study area.

### *Strategic road network*

#### **Primary 'A' roads**

- 5.13.17 The A41 connects London from the M25 junction 20 at Watford to the M40 at junction 9 passing via Hempstead, Aylesbury and Bicester. It is a de-restricted two lane-carriageway from the M25 to Aylesbury and from Bicester to the M40. Within the study area, the A41 runs east of the Proposed Scheme and is single carriageway between Aylesbury and Bicester. The A41 Bicester Road intercepts the Proposed Scheme just north of the study area.
- 5.13.18 The A413 links Gerrards Cross with Towcester, passing through several towns in Buckinghamshire, including Buckingham, Aylesbury, Wendover and Amersham. Within the study area, the A413 Wendover Road/Nash Lee Road runs to the east of the Proposed Scheme into Aylesbury Town Centre, before heading north to Weedon and Hardwick as a secondary 'A' road. Within this section, the A413 Wendover Road/Nash Lee Road is single carriageway in each direction.
- 5.13.19 The A4010 is a north to south road running from High Wycombe at junction 4 of the M40 motorway to Stoke Mandeville, near Aylesbury. It is single carriageway road in each direction along the entire length. Within the study area, the A4010 Risborough Road intersects the Proposed Scheme immediately west of Stoke Mandeville.
- 5.13.20 The A418 is approximately 35km in length and extends from junction 8A of the M40 through Aylesbury town centre, where the carriageway joins the A41, before it rejoins the A418 East to the A4146 near Leighton Buzzard. Within the study area, the A418 Oxford Road intersects the Proposed Scheme to the west of Aylesbury, by Aylesbury Park Golf Club. The road is single carriageway along the entire length of the route.

#### **Non-Primary 'A' roads**

- 5.13.21 The A4157 forms a loop around Aylesbury town centre, connecting the A418 from Oxford to the A413, and then to the A418 to Leighton Buzzard.

### *Local road network*

- 5.13.22 Other Local roads, which are either intersected by, or impacted by the Proposed Scheme are:

- B4009 Nash Lee Road (two-way single carriageway, between the A4010 and A413 south of Stoke Mandeville, which intersects the Proposed Scheme immediately north of Wendover);
- B4443 Lower Road (two-way single carriageway, between Stoke Mandeville and Aylesbury town centre);
- Old Risborough Road (two-way single carriageway);
- Marsh Lane (two-way single carriageway); and
- Nash Lee Lane (two-way single carriageway).

### *Baseline conditions*

5.13.23 2012 base year traffic volumes on the roads subject to assessment have been derived from a combination of traffic surveys and traffic data obtained from other sources, where available.

5.13.24 The following volumes have been recorded:

- 24 hour average annual daily traffic (AADT) combined flows in number of vehicles, with proportions of heavy goods vehicles (HGVs);
- 12 hour average annual weekday traffic (AAWT) combined flows in number of vehicles, with proportions of HGVs; and
- AM (08:00-09:00) and PM (17:00-18:00) peak hour combined flows in number of vehicles, with proportions of HGVs.

Table 5-108: Stoke Mandeville and Aylesbury 2012 baseline flows (vehicles)

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
A4010 Aylesbury Road/Risborough Road (Little Kimble)	EB	679	7	582	2
	WB	767	8	467	2
A4010 Risborough Road (Stoke Mandeville)	NB	724	27	947	16
	SB	844	28	685	7
A4010 Station Road (Stoke Mandeville)	NB	727	12	650	3
	SB	815	20	693	5
A418 Oxford Road (Aylesbury)	NB	1,107	66	901	15
	SB	964	34	1,168	13
A413 Wendover Road (Stoke Mandeville)	EB	1,138	12	806	2
	WB	1,053	16	1,291	14
A418 Berton Rd/Aylesbury Rd	EB	674	11	798	7

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
(Aylesbury)	WB	431	9	318	2
A4157 Elmhurst Rd (Aylesbury)	EB	770	68	649	54
	WB	684	26	520	24
A4157 Weedon Rd (Aylesbury)	EB	365	11	618	10
	WB	365	12	391	4
B4443 Lower Road (Stoke Mandeville)	NB	850	16	963	11
	SB	807	18	775	7
Local road network					
Old Risborough Road (Stoke Mandeville)	NB	5	1	11	1
	SB	5	1	8	0
Marsh Lane (Stoke Mandeville)	NB	96	0	95	0
	SB	112	0	90	0

- 5.13.25 Further information on 2012 baseline traffic data is provided in the Baseline Survey Report in Annex B(iii).

### Accidents and safety

- 5.13.26 Relevant accident data for the road network subject to assessment has been obtained from Buckinghamshire CC for the three year period of 2009 to 2011.
- 5.13.27 The accident data has been interrogated and any clusters of nine or more accidents over a three year period, within 20m of a junction or within 150m on any sections of road between junctions, have been identified. No such accident clusters have been identified in the area.

### Parking and loading

- 5.13.28 Locations where existing public parking and loading will be potentially affected by the Proposed Scheme have been established from site observations and desktop review. This has confirmed that no public parking or loading in this study area will be affected by the Proposed Scheme during construction or operation and therefore baseline conditions have not be provided.

### Public transport

- 5.13.29 The following sections describe rail and local bus and coach services in the area.

### *Rail network*

#### **Marylebone to Aylesbury Line**

- 5.13.30 The Marylebone to Aylesbury Line is a 63km railway line between London and Aylesbury, operated by Chiltern Railways. A frequent service is provided with two to four passenger trains during peak hours and two per hour at other times during the day. Services run seven days a week. Freight services also operate on this line, carrying waste from London to Calvert on the Aylesbury Link.
- 5.13.31 Within the study area, the line runs to the west of the Proposed Scheme, with passenger rail stations located at Stoke Mandeville, Aylesbury and Aylesbury Vale Parkway. There is one service per hour operating between Aylesbury and Aylesbury Vale Parkway. North of Aylesbury Vale Parkway the Aylesbury Link carries waste from London to Calvert.

#### **Princes Risborough to Aylesbury Line**

- 5.13.32 The Princes Risborough to Aylesbury Line is a rural branch line from Princes Risborough to Aylesbury, operated by Chiltern Railways. The line is single track throughout, with two trains running during peak hours, seven days a week. The line is also regularly used by freight services carrying waste from London to Calvert.
- 5.13.33 Within the study area, the line intersects the Proposed Scheme to the west of Stoke Mandeville, on approach to Aylesbury.

### *Local bus services*

- 5.13.34 The following 12 public bus services operate along roads that were subject to assessment:
- route 16 - connecting Aylesbury to Steeple Claydon and serving Waddesdon, Quainton, Grendon Underwood, Edgcott and Calvert;
  - route 18 - connecting Buckingham to Aylesbury serving Waddesdon, Grendon Underwood, Edgcott, Calvert, Steeple Claydon, as well as Twyford, Marsh Gibbon, Launton and Bicester;
  - route 50 - connecting Aylesbury to Ivinghoe and serving Stoke Mandeville, Wendover, Halton, Buckland and Little Brickhill;
  - route 55 - connecting Aylesbury to Amersham and Chesham and serving Stoke Mandeville, Wendover, Great Missenden and Little Missenden;
  - route 150 - connecting Aylesbury to Milton Keynes and serving Bicton, Wing, Leighton Buzzard, and Little Brickhill;
  - route 165 - connecting Aylesbury to Leighton Buzzard and serving Bicton, Wingrave, Cublington, and Wing;
  - route 300 - connecting High Wycombe to Aylesbury and serving Hughenden



Valley, Haphill, Walters Ash, Lacey Green, Princes Risborough, Butlers Cross and Stoke Mandeville;

- route 321 - connecting High Wycombe to Aylesbury and serving Princes Risborough, Butlers Cross and Stoke Mandeville;
- route 613 - connecting Haddenham to Waddesdon and serving Hartwell and Aylesbury;
- route 650 - connecting Aylesbury to Leighton Buzzard and serving Bicton and Wing;
- route 653 - connecting Aylesbury to Wendover and serving Stoke Mandeville; and Broughton; and
- route 655 - connecting Aylesbury to Wendover and serving Stoke Mandeville.

5.13.35 Three of these services operate along the A41 Bicester Road, with a combined peak frequency of up to three buses an hour. Three of these services operate along the A418 Aylesbury Road/Oxford Road, with a combined peak frequency of up to four buses an hour. Two of these services operate along the A4010 Risborough Road, with a combined peak frequency of up to five buses an hour. Four of these services operate along the A413 Wendover Road/Nash Lee Road, with a combined peak frequency of up to five services an hour.

5.13.36 In addition, school bus services are operated by Carousel, and operate via the A4010 Risborough Road from Aylesbury to High Wycombe and Arriva operating via the A41 from Haddenham to Waddesdon School.

#### *Coach services*

5.13.37 No coach services have been identified which operate along roads that were subject to assessment.

#### *Public transport interchanges*

5.13.38 Public interchanges within the study area include bus stops serving the routes listed above, along with passenger rail stations located at Stoke Mandeville, Aylesbury and Aylesbury Vale Parkway on the Marylebone to Aylesbury Line.

#### **Pedestrians, cyclists and equestrians**

5.13.39 PRoW provide links between settlements in the area. The Proposed Scheme crosses PRoW in 13 locations. In addition to the 13 PRoW, the Proposed Scheme crosses four roads with potential for use by non-motorised users.

#### *Pedestrian facilities*

5.13.40 Notable PRoW within the study area are:

- The Thame Valley Walk (a 24km between Aylesbury and Albury) which intercepts the Proposed Scheme to the north of Lower Hartwell and to the west of Aylesbury;

- The North Buckinghamshire Way (a 56km route between Wendover and the county boundary with Northamptonshire) which runs to the west of the Proposed Scheme;
- The Round Aylesbury Walk (a 19km circular route around Aylesbury) which runs to the east of the Proposed Scheme;
- The Aylesbury Ring (a 51km circular route around Aylesbury, passing around Wendover) which runs to the east and west of the Proposed Scheme , but does not intersect it within the study area;
- Midshires Way (a long distance 362km route between Bledlow in Buckinghamshire to Stockport in Greater Manchester) which runs to the west of the Proposed Scheme;
- Swan's Way (a 105km route between Salcey Forest in Northamptonshire and Goring-On-Thames in Oxfordshire ) which is a multi-use trail primarily designed for horseriders and runs to the west of the Proposed Scheme; and
- Bernwood Jubilee Way (a 98km circular route within the boundaries of the ancient hunting forest of Bernwood) which runs to the west of the Proposed Scheme.

5.13.41 There are numerous other PRoW in the area for recreational use, with some also providing connections between settlements in the area. The Baseline Survey Report in Annex B(iii) provides more details on these PRoW.

### **Non-motorised user flows**

5.13.42 PRoW surveys were undertaken in August and September 2012, to establish the nature of the PRoW and their usage by non-motorised users. The surveys included all PRoW and roads that will cross the Proposed Scheme, and any additional PRoW that will be affected by the Proposed Scheme.

5.13.43 The surveys indicated that the majority of roads, footpaths, bridleways and cycleways that will cross the route are used by no more than 30 people per day except for a PRoW at FMA/1 (public Bridleway), A4010 Risborough Road and SBH/2 (public Bridleway) which used by between 40-60 people per day, and the A418 Oxford Road that was used by no more than 80 people per day.

5.13.44 The number of users for each PRoW surveyed is provided in the Baseline Survey Report in Annex B(iii).

### ***Cycle facilities***

5.13.45 The location of PRoW that will be affected by the Proposed Scheme, which include bridleways that can be used by cyclists, is provided in the Baseline Survey Report in Annex B(iii).

- 5.13.46 Aylesbury is of Cycling England's Demonstration Towns and therefore there is a concentration of local cycle routes on roads in and around Aylesbury. Two local cycle routes intersect with the Proposed Scheme south of Aylesbury Park Golf Club.

#### *Equestrian facilities*

- 5.13.47 The location of PRow that will be affected by the Proposed Scheme, which include bridleways for use by equestrians, is provided in the Baseline Survey Report in Annex B(iii).

#### **Waterways and canals**

- 5.13.48 No waterways or canals frequently used by waterborne craft and affected by the Proposed Scheme have been identified within the study area.

#### **Air transport**

- 5.13.49 No airports have been identified within the study area.

## **5.14 Waddesdon and Quainton (CFA12)**

### **Study area**

- 5.14.1 This section provides an overview of the baseline traffic and transport conditions for the Waddesdon and Quainton CFA - CFA12. It describes the transport infrastructure within the study area, which would be affected either by the construction or the operation of the Proposed Scheme.
- 5.14.2 The Proposed Scheme through the study area will be approximately 10km in length. It will commence just south of the A41 Bicester Road, near Fleet Marston, proceeding north-westwards, with Waddesdon to the south-west. It will pass through the southern edge of Quainton, near the Buckinghamshire Railway Centre, and will then run parallel to the Aylesbury Link railway crossing over the River Ray and passing Finemere Wood. The route will exit the area at the north-west corner of Sheephouse Wood, to the south-east of Calvert.
- 5.14.3 The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFA12 Report).
- 5.14.4 The scope of this work has been discussed with Buckinghamshire CC.
- 5.14.5 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from south to north along the proposed route.

### **Local land uses**

- 5.14.6 The route of the Proposed Scheme through the study area passes through predominantly rural land, comprising mixed agricultural land. Development is typically scattered farmsteads and villages. The village of Waddesdon is 1km west of the Proposed Scheme, whilst it will pass through the southern edge of Quainton. Westcott and Edgcott are 1.5km from the Proposed Scheme, whilst Aylesbury is the nearest main town, 3km to the south-east of the route.

### **Surveys**

- 5.14.7 Transport surveys have been undertaken to obtain baseline data in order to undertake an impact assessment of the Proposed Scheme. Traffic surveys, which in some cases included non-motorised user surveys, were undertaken in September 2012 and February 2013. Additionally, surveys specifically recording non-motorised users on PRoW were undertaken in August and September 2012.
- 5.14.8 Further details of the traffic and non-motorised user surveys and schedules for each survey undertaken are included in the Baseline Survey Report in Annex B(iii).

### *Traffic surveys*

- 5.14.9 Traffic surveys were undertaken to establish current traffic flows on the road network subject to assessment, during September 2012 and February 2013. The surveys comprised:
- automatic traffic counts (ATC) on highway links. ATC data was gathered for a continuous two week period; and
  - classified turning count and queue length surveys at highway junctions. Surveys were undertaken on a weekday (Tuesday, Wednesday or Thursdays) between 07:00 and 10:00, and 16:00 and 19:00.
- 5.14.10 The survey data was further supplemented by traffic and transport data obtained from other sources where available, including from Buckinghamshire CC.

### *Non-motorised user surveys*

- 5.14.11 PRoW surveys were undertaken in August and September 2012, to establish the nature of the PRoW and their usage by pedestrians, cyclists and equestrians (non-motorised users). The surveys included all PRoW and roads that will cross the Proposed Scheme and any additional PRoW that will be affected by the Proposed Scheme.
- 5.14.12 The August surveys were carried out between 08:00 and 18:00 on a Sunday to capture users of footpaths, bridleways and some country lanes, where they were identified as being on a National Trail or Long Distance Route. Surveys were undertaken during the summer holidays in order to record maximum recreational usage. September surveys were carried out between 07:00 and 19:00 on a weekday (Tuesday, Wednesday or Thursdays) to capture only users of roads and associated footways. Surveys were undertaken outside of the school holidays in order to record non-recreational usage, such as school and commuting users.

### *Highway network*

- 5.14.13 The main strategic roads and local roads affected by the Proposed Scheme are A41 Aylesbury Road, Akeman Road, High Street (Waddesdon), Bicester Road, Blackgrove Road, Station Road, Quainton Road, Perry Hill, Buckingham Road, Grendon Road, Fiddlers Field Road (also known as Snake Lane), Lee Road, Edgcott Road (also known as Shipton Lee Road), The Broadway and Lawn Hill. The Proposed Scheme crosses five roads within the study area.

### *Strategic road network*

#### **Primary 'A' Roads**

- 5.14.14 The A41 is a busy single carriageway road linking Aylesbury and Bicester, as well as the M25 junction 20 at Watford and the M40 at junction 9 at Wendlebury. Within the study area, the A41 Bicester Road intersects the Proposed Scheme approximately 5km to the north west of Aylesbury, between Aylesbury Vale Parkway Station and the village of Waddesdon.

### *Local road network*

- 5.14.15 Local roads, which are either intersected by, or impacted by the Proposed Scheme are:
- Blackgrove Road (two-way single carriageway);
  - Station Road (two-way single carriageway);
  - Quainton Road (two-way single carriageway);
  - Perry Hill (two-way single carriageway);
  - Buckingham Road (two-way single carriageway);
  - Grendon Road (two- way single carriageway);
  - Fiddlers Field Road (also known as Snake Lane) (two-way single carriageway) ;
  - Lee Road (two-way single carriageway);
  - Edgcott Road (also known as Shipton Lee Road) (two-way single carriageway);
  - The Broadway (two-way single carriageway); and
  - Lawn Hill (two-way single carriageway).

### *Baseline conditions*

- 5.14.16 2012 base year traffic volumes on the roads subject to assessment have been derived from a combination of traffic surveys and traffic data obtained from other sources, where available.
- 5.14.17 The following volumes have been recorded:
- 24 hour average annual daily traffic (AADT) combined flows in number of vehicles, with proportions of heavy goods vehicles (HGVs);
  - 12 hour average annual weekday traffic (AAWT) combined flows in number of vehicles, with proportions of HGVs; and
  - AM (08:00-09:00) and PM (17:00-18:00) peak hour combined flows in number of vehicles, with proportions of HGVs.



Table 5-109: Waddesdon and Quainton 2012 baseline flows (vehicles)

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
Strategic road network					
A41 (east of Blackgrove Road, Waddeson)	EB	913	109	697	55
	WB	633	84	832	58
A41 (west of Blackgrove Road, Waddeson)	EB	912	66	767	26
	WB	722	61	756	22
A41 Aylesbury Road (between Bicester and Grendon Underwood)	EB	912	66	767	26
	WB	722	61	756	22
Local road network					
Blackgrove Road (Waddeson)	NB	156	2	302	1
	SB	252	2	112	1
Waddesdon Hill (Waddeson)	NB	155	8	220	2
	SB	264	6	129	2
Station Road (south west of Quainton Rd, Quainton)	NB	54	5	85	2
	SB	93	6	42	3
Quainton Road (Quainton)	NB	37	1	48	0
	SB	99	0	38	1
Station Road (north east of Quainton Rd, Quainton)	EB	64	1	84	1
	WB	126	1	52	0
Fidlers Field Lane (also known as Snake Lane, Quainton)	NB	30	0	47	0
	SB	74	0	27	0
Lawn Hill/Buckingham Road (Quainton)	EB	48	1	32	1
	WB	27	1	31	2
Lee Rd/Lower Street(Quainton)	EB	99	17	63	3
	WB	97	7	91	7
Grendon Rd/Buckingham Road (Edgcott)	NB	239	7	83	1
	SB	89	5	203	1
The Broadway (Grendon Underwood)	NB	109	5	203	0
	SB	220	7	82	0

- 5.14.18 Further information on 2012 baseline traffic data is provided in the Baseline Survey Report in Annex B(iii).

### **Accidents and safety**

- 5.14.19 Relevant accident data for the road network subject to assessment has been obtained from Buckinghamshire CC for the three year period of 2009 to 2011.
- 5.14.20 The accident data has been interrogated and any clusters of nine or more accidents over a three year period, within 20m of a junction or within 150m on any sections of road between junctions, have been identified. No such accident clusters have been identified in the area.

### **Parking and loading**

- 5.14.21 Locations where existing public parking and loading will be potentially affected by the Proposed Scheme have been established from site observations and desktop review. Within the study area, a field adjacent to the Buckingham Railway Centre near Quainton is currently used as an overflow car park for the centre, which during events held at weekends. It has been calculated that the overflow car park has the potential to hold up to approximately 1,000 vehicles (based on 25sq.m per space).

### **Public transport**

- 5.14.22 The following sections describe the rail, bus and coach services in the area.

#### *Strategic rail network*

##### **Aylesbury Link**

- 5.14.23 The Aylesbury Link is a single track freight only line and is a continuation of the passenger service Marylebone to Aylesbury Line which terminates at Aylesbury Vale Parkway station. Freight services operate on the line at a frequency of approximately two trains per day.
- 5.14.24 Within the study area, the Aylesbury Link runs to the east and parallel to the Proposed Scheme, en route to Calvert where there is a waste depot. There is a rail station at Quainton Road and although no scheduled passenger trains pass through the station, it remains connected to the railway network. Passenger trains call at the station for organised events at the Buckinghamshire Railway Centre, which take place on most weekends during summer months and on a less frequent basis during the rest of the year.

#### *Local bus services*

- 5.14.25 The following three public bus services operate along roads that were subject to assessment:
- route 16 – connecting Aylesbury to Steeple Claydon serving Waddesdon, Quainton, Grendon Underwood, Edgcott and Calvert;
  - route 18 – connecting Buckingham to Aylesbury serving Waddesdon, Grendon

Underwood, Edgcott, Calvert, Steeple Claydon, as well as Twyford, Marsh Gibbon, Launton and Bicester; and

- route 613 – connecting Haddenham to Waddesdon serving Hartwell and Aylesbury.

5.14.26 Three of these services operate along the A41 High Street through Waddesdon, with a combined peak frequency of up to three buses an hour. Route 16 also operates along Quainton Road/Station Road with a weekday peak frequency of up to one bus an hour.

5.14.27 In addition, school bus services are operated by Arriva from Haddenham to Waddesdon School via the A41.

#### *Coach services*

5.14.28 Coach services most frequently operate along primary 'A' roads, but also operate on a less frequent basis on other roads within the study area.

#### *Public transport interchanges*

5.14.29 Public interchanges within the study area include bus stops serving the routes listed above. No further public transport interchanges of significance have been identified within the study area.

#### **Pedestrians, cyclists and equestrians**

5.14.30 PRoW provide links between villages within the study area. The Proposed Scheme crosses PRoW in 13 locations. In addition to the 13 PRoW, the Proposed Scheme crosses five roads.

#### *Pedestrian facilities*

5.14.31 Notable PRoW within the study area are:

- The Aylesbury Ring (a 51km circular route around Aylesbury, passing around Wendover) which intersects the Proposed Scheme to the north of Waddesdon;
- The North Buckinghamshire Way (a 56km route between Wendover and the county boundary with Northamptonshire), the Bernwood Jubilee Way (a 61 mile circular route within the boundaries of the ancient hunting forest of Bernwood) and the Midshires Way (a long distance 225 mile route between Bledlow in Buckinghamshire to Stockport in Greater Manchester) which all pass through Waddesdon and Quainton and intersect the Proposed Scheme to the north of Waddesdon; and
- Swan's Way (a 105km route between Salcey Forest in Northamptonshire and Goring-On-Thames in Oxfordshire) which is a multi-use trail primarily designed for horseriders and intersects the Proposed Scheme to the east of Waddesdon.

- 5.14.32 There are numerous other PRoW in the area for recreational use, with some also providing connections between settlements in the area. The Baseline Survey Report in Annex B(iii) provides more details on these PRoW.

### **Non-motorised user flows**

- 5.14.33 PRoW surveys were undertaken in August and September 2012, to establish the nature of the PRoW and their usage by non-motorised users. The surveys included all PRoW and roads that will cross the Proposed Scheme, and any additional PRoW that will be affected by the Proposed Scheme.
- 5.14.34 The surveys indicated that all of the roads, footpaths, bridleways and cycleways that will cross the route are used by no more than 10 people per day.
- 5.14.35 The number of users for each PRoW surveyed is provided in the Baseline Survey Report in Annex B(iii).

### *Cycle facilities*

- 5.14.36 The location of PRoW that will be affected by the Proposed Scheme, which include bridleways that can be used by cyclists, is provided in the Baseline Survey Report in Annex B(iii).

### *Equestrian facilities*

- 5.14.37 The location of PRoW that will be affected by the Proposed Scheme, which include bridleways for use by equestrians, is provided in the Baseline Survey Report in Annex B(iii).

### **Waterways and canals**

- 5.14.38 No waterways or canals frequently used by waterborne craft and affected by the Proposed Scheme have been identified within the study area.

### **Air transport**

- 5.14.39 No airports have been identified within the study area.

## 5.15 Calvert, Steeple Claydon, Twyford and Chetwode (CFA13)

### Study area

- 5.15.1 This section provides an overview of the baseline traffic and transport conditions for the Calvert, Steeple Claydon, Twyford and Chetwode CFA. It describes the transport infrastructure within the study area, which would be affected either by the construction or the operation of the Proposed Scheme.
- 5.15.2 The Proposed Scheme through this area will be approximately 10km in length. It will commence at the northern edge of Sheephouse Wood, to the south of Calvert, and then proceed in a north-west direction parallel to the realigned Aylesbury Link. It will then pass to the east of Calvert, under the realigned Bicester to Bletchley Line, then west of Steeple Claydon, broadly following the alignment of the disused Great Central Main Line (GCML).
- 5.15.3 The Calvert Infrastructure Maintenance Depot (IMD) will be located in the land adjacent to the Proposed Scheme, north-east of the Bicester to Bletchley Line crossing, and the associated tracks will run west to east alongside the Bicester to Bletchley Line for approximately 3km, approximately 600m south of Steeple Claydon.
- 5.15.4 The route will continue to the north-west and will pass to the east of Twyford, crossing the Padbury Brook three times before passing to the east of Godington. It will continue past the west of Chetwode and on towards the county boundary between Buckinghamshire and Oxfordshire, to the west of Barton Hartshorn.
- 5.15.5 The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFA13 Report).
- 5.15.6 The scope of this work has been discussed with Buckinghamshire CC and Oxfordshire County Council (OCC).
- 5.15.7 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from south to north along the proposed route.

### Local land uses

- 5.15.8 The route of the Proposed Scheme through the study area passes through predominantly rural land, with agriculture being the main land use. Development is typically small villages and isolated farmsteads. The largest settlement is Steeple Claydon, to the east of the Proposed Scheme and north of the IMD.

## Surveys

5.15.9 Transport surveys have been undertaken to obtain baseline data in order to undertake an impact assessment of the Proposed Scheme. Traffic surveys, which in some cases included non-motorised user surveys, were undertaken in June and September 2012 and February 2013. Additionally, surveys specifically recording non-motorised users on PRoW were undertaken in August and September 2012.

5.15.10 Further details of the traffic and non-motorised user surveys and schedules for each survey undertaken are included in the Baseline Survey Report in Annex B(iii).

### *Traffic surveys*

5.15.11 Traffic surveys were undertaken to establish current traffic flows on the road network subject to assessment, during June and September 2012 and February 2013. The surveys comprised:

- automatic traffic counts (ATC) on highway links. ATC data was gathered for a continuous two week period; and
- classified turning count and queue length surveys at highway junctions. Surveys were undertaken on a weekday (Tuesday, Wednesday or Thursdays) between 07:00-10:00, and 16:00-19:00.

5.15.12 The survey data was further supplemented by traffic and transport data obtained from other sources where available, including from Buckinghamshire CC and OCC.

### *Non-motorised user surveys*

5.15.13 PRoW surveys were undertaken in August and September 2012, to establish the nature of the PRoW and their usage by pedestrians, cyclists and equestrians (non-motorised users). The surveys included all PRoW and roads that will cross the Proposed Scheme and any additional PRoW that will be affected by the Proposed Scheme.

5.15.14 The August surveys were carried out between 08:00 and 18:00 on a Sunday to capture users of footpaths, bridleways and some country lanes, where they were identified as being on a National Trail or Long Distance Route. Surveys were undertaken during the summer holidays in order to record maximum recreational usage. September surveys were carried out between 07:00 and 19:00 on a weekday (Tuesday, Wednesday or Thursdays) to capture only users of roads and associated footways. Surveys were undertaken outside of the school holidays in order to record non-recreational usage, such as school and commuting users.



## Highway network

- 5.15.15 The main strategic roads affected by the Proposed Scheme are the A4421 Neunkirchen Way, Wretchwick Way, Charbridge Lane, A421 Tingewick Road and the A41 Aylesbury Road. The local highway links that will be affected by the Proposed Scheme include School Hill, Perry Hill, Addison Road, Main Street, West Street, School End/Barton Hartshorn Road, Barton Road, Buckingham Road, Gawcott Road, and Manor Farm Road. The Proposed Scheme crosses eight roads within the study area.

### *Strategic road network*

#### **Primary 'A' roads**

- 5.15.16 The A41 is a busy single carriageway road linking Aylesbury and Bicester, as well as the M25 junction 20 at Watford and the M40 at junction 9 at Wendlebury. Within the study area, the A41 runs from east to west, to the south of the Proposed Scheme.
- 5.15.17 The A4421 is a single carriageway road linking Bicester with the A421 in a north-eastwards direction. The A4421 links with the A421 to north of the Proposed Scheme at the northern boundary of the area.
- 5.15.18 The A421 run from east to west, from the A1, just south of St Neots, to the A43 junction south of Brackley. It passes through towns in Bedfordshire and Buckinghamshire. Within the study area, the A41 is single carriageway and runs from east to west, to the north of the Proposed Scheme.

### *Local road network*

- 5.15.19 Local roads, which are either intersected by, or impacted by the Proposed Scheme are:
- School Hill (two-way single carriageway);
  - Perry Hill (two-way single carriageway);
  - Addison Road (two-way single carriageway);
  - Main Street (two-way single carriageway);
  - West Street (two-way single carriageway);
  - School End/Barton Hartshorn Road (two-way single carriageway);
  - Barton Road (two-way single carriageway);
  - Buckingham Road (two-way single carriageway);
  - Gawcott Road (two-way single carriageway); and
  - Manor Farm Road (two-way single carriageway).

*Baseline conditions*

- 5.15.20 2012 base year traffic volumes on the roads subject to assessment have been derived from a combination of traffic surveys and traffic data obtained from other sources, where available.
- 5.15.21 The following volumes have been recorded:
- 24 hour average annual daily traffic (AADT) combined flows in number of vehicles, with proportions of heavy goods vehicles (HGVs);
  - 12 hour average annual weekday traffic (AAWT) combined flows in number of vehicles, with proportions of HGVs; and
  - AM (08:00-09:00) and PM (17:00-18:00) peak hour combined flows in number of vehicles, with proportions of HGVs.

Table 5-110: Calvert, Steeple Claydon, Twyford and Chetwode 2012 baseline flows (vehicles)

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
Strategic road network					
A41 (between Bicester and Grendon Underwood)	EB	912	66	767	26
	WB	722	61	756	22
Local road network					
School Hill (east of Brackley Lane, Calvert)	EB	134	2	140	1
	WB	114	8	94	5
School Hill (west of Brackley Lane, Calvert)	EB	125	6	93	0
	WB	107	6	111	0
Perry Hill (south of School Hill, Calvert)	NB	110	10	176	3
	SB	167	8	100	6
School Hill (west of Perry Hill, Calvert)	EB	56	4	74	3
	WB	70	5	48	3
School Hill east of Addison Road, Calvert)	EB	84	5	80	3
	WB	58	2	68	0
Addison Road (south of Bicester to Bletchley rail line, Steeple Claydon)	NB	68	1	98	0
	SB	77	0	57	0
Addison Road (north of Bicester to Bletchley rail line, Steeple Claydon)	NB	68	1	98	0
	SB	77	0	57	0
Main Street (north of School Hill,	NB	39	4	52	5

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
Charndon)	SB	31	1	51	3
Perry Hill (north of School Hill, Calvert)	NB	84	1	95	1
	SB	92	4	61	2
West Street (east of Perry Hill, Twyford)	EB	41	0	78	0
	WB	66	0	47	0
West Street (west of Perry Hill, Steeple Claydon)	EB	62	1	77	0
	WB	63	1	70	1
Main Street (Charndon)	EB	54	4	87	4
	WB	63	2	59	2
Portway Road (Twyford)	NB	70	3	80	3
	SB	81	7	87	5
Perry Hill (north of West Street, Steeple Claydon)	EB	130	8	134	2
	WB	123	9	113	8
The Green, Manthorn Farm (Chetwode)	NB	4	0	3	0
	SB	4	0	4	0
School End (Chetwode)	NB	5	1	9	0
	SB	7	0	7	0
Manor Farm Road (Barton Hartshorn)	NB	22	0	22	0
	SB	15	0	14	0
Buckingham Rd/Gawcott Road (Gawcott)	EB	159	2	94	0
	WB	96	1	122	0
Barton Road (between Manor Farm Road and A421, Barton Hartshorn)	NB	19	3	23	2
	SB	15	2	12	1

5.15.22 Further information on 2012 baseline traffic data is provided in the Baseline Survey Report in Annex B(iii).

### Accidents and safety

5.15.23 Relevant accident data for the road network subject to assessment has been obtained from Buckinghamshire CC and OCC for the three year period of 2009 to 2011.

- 5.15.24 The accident data has been interrogated and any clusters of nine or more accidents over a three year period, within 20m of a junction or within 150m on any sections of road between junctions, have been identified. No such accident clusters have been identified in the area.

### **Parking and loading**

- 5.15.25 It has been considered that parking is not of specific relevance to the rural context of the area and no parking facilities of relevance have been identified for assessment.

### **Public transport**

- 5.15.26 The following sections describe the rail, bus and coach services in the area.

#### *Rail network*

##### **Aylesbury Link**

- 5.15.27 The Aylesbury Link is a single track freight only line and is a continuation of the passenger service Marylebone to Aylesbury Line which terminates at Aylesbury Vale Parkway station. Freight services operate on the line at a frequency of approximately two trains per day.
- 5.15.28 Within the study area, the Aylesbury Link runs to the east and parallel to the Proposed Scheme, en route to Calvert where there is a waste depot. Beyond Calvert, there is a junction; one line goes east and joins the Oxford to Cambridge Line, while the main line goes north and becomes the dismantled Great Central Main Line (GCML).

##### **Bicester to Bletchley Line**

- 5.15.29 The Bicester to Bletchley Line forms part of the former Oxford to Cambridge Line. The only sections of this line still in regular passenger use today are the Oxford to Bicester Line from Oxford to Bicester Town, and the Marston Vale Line operation from Bletchley to Bedford. Services on the Oxford to Bicester line are approximately 12 a day. The Bicester to Calvert section carries freight traffic but the Calvert to Bletchley section, though extant, is currently disused.

#### *Local bus services*

- 5.15.30 The following five bus services operate along roads that were subject to assessment:
- route 16 – connecting Aylesbury to Steeple Claydon and serving Waddesdon , Quainton, Grendon Underwood, Edgcott and Calvert;
  - route 18 – connecting Buckingham to Aylesbury and serving Waddesdon, Grendon Underwood, Edgcott, Calvert, Steeple Claydon, as well as Twyford, Marsh Gibbon, Launton and Bicester;
  - route 30 – connecting Oakley to Bicester and serving Brill, Ludgershall and Arncott;

- route 135 – connecting Buckingham to Steeple Claydon, Middle Claydon, East Claydon and Botolph Claydon and serving Gawcott, Hillesdon, Twyford, Poundon, Marsh Gibbon, Charndon, Calvert, and Padbury; and
- route T94 – connecting Oxford to Bicester and serving Gosford, Islip, Charlton on Otmoor, Morton, Ambrosden, Piddington and Blackthorn.

5.15.31 Two of these services operate along the A41 Aylesbury Road with a combined weekday peak frequency of up to two buses an hour. Two of these services also operate along Edgcott Road, Grendon Road, Buckingham Road and Perry Hill with a combined weekday peak frequency of up to two buses an hour. Three of these services operate along School Hill with a combined weekday peak frequency of two buses an hour with Route 135 being a Saturday only service. Two of these services operate along Main Street with a weekday peak frequency of one bus an hour, again with Route 135 being a Saturday only service.

### **Other bus services**

5.15.32 Moulton College operates a network of subsidised minibuses and coaches, offering transport to students from most parts of Northamptonshire and some parts of neighbouring counties. These include:

- Moulton: 18 routes;
- South Northants Vocational Skills Academy (Silverstone): three routes;
- East Northants Vocational Skills Academy (Rushden): three routes; and
- Daventry: two routes.

5.15.33 The routes and times can be varied and subject to demand, although generally operate once a day to and from their respective campus and have been timetabled to arrive at 08:50 and depart at 17:20.

5.15.34 Within the study area, Route 2 (Moulton) runs in close proximity to the Proposed Scheme, via the A413 including Winslow, Adstock and Padbury to the east of IMD at Calvert.

### *Coach services*

5.15.35 Coach services most frequently operate along Primary A roads, but also operate on a less frequent basis on other roads within the study area.

5.15.36 Long distance coaches operate from Oxford to Cambridge via Milton Keynes via the A43. This runs every 30 minutes during peak periods and operates as a local service within Oxfordshire. In addition, the X6 is a long distance coach service that links from Banbury and crosses the alignment of the Proposed Scheme in Buckinghamshire.

### *Public transport interchanges*

- 5.15.37 Public interchanges within the study area include bus stops serving the routes listed above. No further public transport interchanges of significance have been identified within the study area.

### **Pedestrians, cyclists and equestrians**

- 5.15.38 PRow provide links between settlements within the study area. The Proposed Scheme crosses PRow in 18 locations. In addition to the 18 PRow, the Proposed Scheme crosses eight roads.

### *Pedestrian facilities*

- 5.15.39 Notable PRow within the study area are:
- The North Buckinghamshire Way (a 56km route between Wendover and the county boundary with Northamptonshire) which intersects the Proposed Scheme just north of Twyford; and
  - The Bernwood Jubilee Way (a 98km circular route within the boundaries of the ancient hunting forest of Bernwood) which intersects the Proposed Scheme just south of Chetwode.
- 5.15.40 There are numerous other PRow in the area for recreational use, with some also providing connections between settlements in the area. The Baseline Survey Report in Annex B(iii) provides more details on these PRow.

### **Non-motorised user flows**

- 5.15.41 PRow surveys were undertaken in August and September 2012, to establish the nature of the PRow and their usage by non-motorised users. The surveys included all PRow and roads that will cross the Proposed Scheme, and any additional PRow that will be affected by the Proposed Scheme.
- 5.15.42 The surveys indicated that all of the roads, footpaths, bridleways and cycleways that will cross the route are used by no more than 30 people per day.
- 5.15.43 The number of users for each PRow surveyed is provided in the Baseline Survey Report in Annex B(iii).

### *Cycle facilities*

- 5.15.44 The location of PRow that will be affected by the Proposed Scheme, which include bridleways that can be used by cyclists, is provided in the Baseline Survey Report in Annex B(iii).
- 5.15.45 National Cycle Route 51 is a long distance cycle route running broadly east to west, connecting Colchester to Oxford, via Milton Keynes, Bedford, Bury St Edmunds and Ipswich. It intersects the Proposed Scheme within the study area at West Street.



### *Equestrian facilities*

- 5.15.46 The location of PRow that will be affected by the Proposed Scheme, which include bridleways for use by equestrians, is provided in the Baseline Survey Report in Annex B(iii).

### **Waterways and canals**

- 5.15.47 No waterways or canals frequently used by waterborne craft and affected by the Proposed Scheme have been identified within the study area.

### **Air transport**

- 5.15.48 No airports have been identified within the study area.

## **5.16 Newton Purcell to Brackley (CFA14)**

### **Study area**

- 5.16.1 This section provides an overview of the baseline traffic and transport conditions for the Newton Purcell to Brackley CFA. It describes the transport infrastructure within the study area, which would be affected either by the construction or the operation of the Proposed Scheme.
- 5.16.2 The Proposed Scheme through this area will be approximately 12km in length. It will commence from south-east of Newton Purcell in a cutting. It will then continue north-west, passing just east of Newton Purcell. After passing just to the east of Mixbury, the Proposed Scheme will cross the River Great Ouse on a viaduct to the west of Westbury.
- 5.16.3 The Proposed Scheme will continue north-west through a cutting passing just to the east of Turweston before re-crossing the River Great Ouse on a viaduct. It will continue north-west, predominantly in cutting, crossing the A43 Oxford Road to the east of Brackley before crossing the Helmdon Disused Railway SSSI to the south of Radstone. The Proposed Scheme will leave this area south-west of Halse Copse South, near Radstone.
- 5.16.4 The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFA14 Report).
- 5.16.5 The scope of this work has been discussed with the HA, Buckinghamshire CC, OCC and Northamptonshire County Council (NCC).
- 5.16.6 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from south to north along the proposed route.

### **Local land uses**

- 5.16.7 The route of the Proposed Scheme through the study area passes through predominantly rural land, with mixed agriculture being the main land use. Development is typically small villages and isolated farmsteads. The villages of Newton Purcell, Westbury, Turweston, Whitfield and Radstone lie in proximity to the Proposed Scheme, whilst the largest settlement is the town of Brackley, located 900m to the west of the Proposed Scheme.

### **Surveys**

- 5.16.8 Transport surveys have been undertaken to obtain baseline data in order to undertake an impact assessment of the Proposed Scheme. Traffic surveys, which in some cases included non-motorised user surveys, were undertaken in June and September 2012 and February 2013. Additionally, surveys specifically recording non-motorised users on PRoW were undertaken in August and September 2012.

- 5.16.9 Further details of the traffic and non-motorised user surveys and schedules for each survey undertaken are included in the Baseline Survey Report in Annex B(iii).

### *Traffic surveys*

- 5.16.10 Traffic surveys were undertaken to establish current traffic flows on the road network subject to assessment, during June and September 2012 and February 2013. The surveys comprised:
- automatic traffic counts (ATC) on highway links. ATC data was gathered for a continuous two week period; and
  - classified turning count and queue length surveys at highway junctions. Surveys were undertaken on a weekday (Tuesday, Wednesday or Thursdays) between 07:00-10:00, and 16:00-19:00.

- 5.16.11 The survey data was further supplemented by traffic and transport data obtained from other sources where available, including from the HA, Buckinghamshire CC, OCC and NCC.

### *Non-motorised user surveys*

- 5.16.12 PRoW surveys were undertaken in August and September 2012, to establish the nature of the PRoW and their usage by pedestrians, cyclists and equestrians (non-motorised users). The surveys included all PRoW and roads that will cross the Proposed Scheme and any additional PRoW that will be affected by the Proposed Scheme.
- 5.16.13 The August surveys were carried out between 08:00 and 18:00 on a Sunday to capture users of footpaths, bridleways and some country lanes, where they were identified as being on a National Trail or Long Distance Route. Surveys were undertaken during the summer holidays in order to record maximum recreational usage. September surveys were carried out between 07:00 and 19:00 on a weekday (Tuesday, Wednesday or Thursdays) to capture only users of roads and associated footways. Surveys were undertaken outside of the school holidays in order to record non-recreational usage, such as school and commuting users.

### **Highway network**

- 5.16.14 The main strategic roads and local roads affected by the Proposed Scheme are the A43 Oxford Road, A4421 Buckingham Road, A421 London Road, A422 Brackley Road, B4525 Welsh Road, Manor Farm Road, Featherbed Lane (also known as Fulwell Lane), Fulwell Road, Valley Road (Finmere), Mere Road, Sandpit Hill, Northampton Road, Turweston Road, Turweston Green, South Bank and Radstone Road. The Proposed Scheme crosses six roads within the study area.

### *Strategic road network*

#### **Primary 'A' roads**

- 5.16.15 The A43 links the M1 and M40, via Brackley. Within the study area, the A43 is dual carriageway and runs from east to west, and intersects the Proposed Scheme to the east of Brackley.
- 5.16.16 The A421 runs from east to west, from the A1, just south of St Neots, to the A43 junction south of Brackley. It passes through towns in Bedfordshire and Buckinghamshire. Within the study area, the A41 is single carriageway and runs from east to west, and intersects the Proposed Scheme to the west of Finmere.
- 5.16.17 The A4421 is a single carriageway road linking Bicester with the A421 in a north-eastwards direction. Within the study area, the A4421 intersects the Proposed Scheme to the immediate north east of Newton Purcell.

#### **Non-Primary 'A' roads**

- 5.16.18 The A422 is a predominantly single carriageway road between Bedford and Worcester, via Milton Keynes, Buckingham, Banbury and Stratford-upon-Avon. Within the study area, the A422 Brackley Road is single carriageway and runs from east to west, intersecting the Proposed Scheme to the east of Brackley.

### *Local road network*

- 5.16.19 Local roads, which are either intersected by, or impacted by the Proposed Scheme are:
- B4525 Welsh Road (A422 to A43) (two-way single carriageway, which runs to the east of the Proposed Scheme);
  - Manor Farm Road (single carriageway with passing places);
  - Featherbed Lane (also known as Fulwell Lane) (single carriageway with passing places);
  - Fulwell Road (two-way-single carriageway);
  - Valley Road (Finmere) (two-way single carriageway);
  - Mere Road (two-way single carriageway);
  - Sandpit Hill (two-way single carriageway);
  - Northampton Road (two-way single carriageway);
  - Turweston Road (two-way single carriageway);
  - Turweston Green (two-way single carriageway);
  - South Bank (two-way single carriageway); and

- Radstone Road (two-way single carriageway).

### *Baseline conditions*

- 5.16.20 2012 base year traffic volumes on the roads subject to assessment have been derived from a combination of traffic surveys and traffic data obtained from other sources, where available.
- 5.16.21 The following volumes have been recorded:
- 24 hour average annual daily traffic (AADT) combined flows in number of vehicles, with proportions of heavy goods vehicles (HGVs);
  - 12 hour average annual weekday traffic (AAWT) combined flows in number of vehicles, with proportions of HGVs; and
  - AM (08:00-09:00) and PM (17:00-18:00) peak hour combined flows in number of vehicles, with proportions of HGVs.

Table 5-111: Newton Purcell to Brackley 2012 baseline flows (vehicles)

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
Strategic road network					
A422 Brackley Road (Westbury)	EB	371	9	315	2
	WB	357	6	336	3
A4421 Buckingham Road (south of Barton Hartshorn, Newton Purcell)	NB	465	10	676	13
	SB	551	11	490	5
A4421 Buckingham Road (north of Barton Hartshorn)	NB	447	25	668	27
	SB	553	28	485	16
A421 (London Road, Mixbury)	EB	473	22	405	15
	WB	410	24	476	16
A43 Oxford Road (south of Northampton Road, Brackley)	NB	931	111	1375	134
	SB	1,537	158	978	83
A43 Oxford Road (north of Northampton Road,Brackley)	NB	1,212	63	1,504	76
	SB	1,539	82	1,292	61
A43 (Brackley to M40)	NB	1,097	149	1,497	145
	SB	1,132	137	1,672	140
A43 (between A421 and A422, Brackley)	NB	1,132	137	1,672	140
	SB	1,508	175	1,217	101

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
A43 (between A422W and A422E, Brackley)	NB	1,216	143	1,506	140
	SB	1,433	181	1,333	106
A43 (SW of Silverstone)	NB	1,106	150	1,510	146
	SB	1,650	216	1,458	120
B4525 Welsh Lane (Helmdon)	EB	234	9	220	4
	WB	217	7	190	4
Local road network					
Manor Farm Lane (Newton Purcell)	EB	22	0	22	0
	WB	15	0	14	0
Turweston Farm Track/ Oatleys Road (Turweston)	EB	5	0	5	0
	WB	8	0	6	0
Featherbed Lane (Mixbury)	NB	24	1	16	0
	SB	20	0	14	0
Northampton Road (Brackley)	NB	377	9	264	3
	SB	263	4	352	2
Radstone Road (Radstone)	NB	74	0	95	1
	SB	119	1	61	0
Fulwell Rd (Finmere)	EB	18	3	15	1
	WB	28	0	19	0
Turweston Road/South Bank (Turweston)	NB	19	0	29	0
	SB	31	0	15	0

- 5.16.22 Further information on 2012 baseline traffic data is provided in the Baseline Survey Report in Annex B(iii).

### Accidents and safety

- 5.16.23 Relevant accident data for the road network subject to assessment has been obtained from Buckinghamshire CC, OCC and NCC for the three year period of 2009 to 2011, and from Highways Agency for the five year period of 2007 to 2011.



- 5.16.24 The accident data has been interrogated and any clusters of nine or more accidents over a three year period, within 20m of a junction or within 150m on any sections of road between junctions, have been identified. One such cluster was found within the study area, being the junction of the A43 with the M40, where 10 accidents were recorded between 2007 and 2009.

### **Parking and loading**

- 4.1.2 Locations where existing public parking and loading will be potentially affected by the Proposed Scheme have been established from site observations and desktop review. This has confirmed that no public parking or loading in this study area will be affected by the Proposed Scheme during construction or operation and therefore baseline conditions have not be provided.

### **Public transport**

- 5.16.25 The following sections describe rail and local bus and coach services in the area.

#### *Rail network*

- 5.16.26 There are no rail services that are affected by the Proposed Scheme in this area. The Proposed Scheme, however, does lie partly on, and adjacent to, the former GCML railway within the study area. It will also intersect the disused Banbury to Verney Junction Branch Line railway, which runs from east to west across the area.

#### *Local bus and coach services*

##### **Bus services**

- 5.16.27 The following eight public bus services operate along roads that were subject to assessment:
- route 499 – connecting Banbury to Brackley and serving Middleton Cheney, Bodicote, Twyford, Kings Sutton, Charlton, Aynho, Croughton, and Evenly;
  - route B500 – a demand responsive service covering the Northamptonshire and Oxfordshire areas;
  - route C500 – a demand responsive service covering the Northamptonshire and Oxfordshire areas;
  - route 8 – connecting Weston Favell to Bicester and serving Northampton, Milton Malsor, Blisworth, Towcester, Syresham, and Whitfield;
  - route T2A – connecting Banbury to Brackley;
  - route 132 – connecting Buckingham to Brackley and serving Gawcott, Tingewick, Finmere, Westbury, and Turweston;
  - route 500 – connecting Banbury to Brackley and serving Chacombe, Middleton Cheney, and Farthinghoe; and

- route 37 – connecting Bicester to Finmere and serving Fringford.

5.16.28 Two of these services operate along the A43 north of Brackley, at a peak frequency of up to four buses an hour. Three of these services operate along the A422 Brackley Road at a peak frequency of up to four buses an hour. Route 499 operates along the A43 south of Brackley, at a peak frequency of up to one bus an hour and Route 37 operates along the A4421 Buckingham Road at a peak frequency of up to one bus an hour.

5.16.29 In addition to the above, the demand responsive services B500 and C500 operate along the A43 south of Brackley and the A422 Brackley Road as required, with a potential maximum combined peak frequency of two buses an hour.

### **Other bus services**

5.16.30 Moulton College operates a network of subsidised minibuses and coaches, offering transport to students from most parts of Northamptonshire and some parts of neighbouring counties. These include:

- Moulton: 18 routes;
- South Northants Vocational Skills Academy (Silverstone): three routes;
- East Northants Vocational Skills Academy (Rushden): three routes; and
- Daventry: two routes.

5.16.31 The routes and times can be varied and subject to demand, although generally operate once a day to and from their respective campus and have been timetabled to arrive at 08:50 and depart at 17:20.

5.16.32 Within the study area, Route S3 (South Northants Vocational Skills Academy) via the A361 including Banbury, Middleton Cheney and Chipping Warden and intersects the Proposed Scheme.

### *Coach services*

5.16.33 Coach services most frequently operate along Primary 'A' roads, but also operate on a less frequent basis on other roads within the study area.

5.16.34 The X5 coach service operates from Oxford to Cambridge, via the A43. The service is operated by Stagecoach at a frequency of every 30 minutes during peak periods, seven days a week. The service intersects the Proposed Scheme on the A4421, north of Newton Purcell.

### *Public transport interchanges*

5.16.35 Public interchanges within the study area include bus stops serving the routes listed above. No further public transport interchanges of significance have been identified within the study area.

## **Pedestrians, cyclists and equestrians**

- 5.16.36 PRow provide links between settlements in the area. The Proposed Scheme crosses PRow in 15 locations. In addition to the 15 PRow, the Proposed Scheme crosses six roads.

### *Pedestrian facilities*

- 5.16.37 Notable PRow within the study area are:
- The Westbury Circular Ride (a 19km local circular route) which intersects the Proposed Scheme at Westbury Viaduct and at Turweston;
  - The Palladian Way (a 190km route between Buckingham and Bath) which intersects the Proposed Scheme to the east of Brackley; and
  - The Seven Shires Way (a 377km route around the Oxfordshire county boundary) intersects the Proposed Scheme between Mixbury and Westbury.
- 5.16.38 There are numerous other PRow in the area for recreational use, with some also providing connections between settlements in the area. The Baseline Survey Report in Annex B(iii) provides more details on these PRow.

### **Non-motorised user flows**

- 5.16.39 PRow surveys were undertaken in August and September 2012, to establish the nature of the PRow and their usage by non-motorised users. The surveys included all PRow and roads that will cross the Proposed Scheme, and any additional PRow that will be affected by the Proposed Scheme.
- 5.16.40 The surveys indicated that the majority of the roads, footpaths, bridleways and cycleways crossing the route are used by no more than 30 people per day, apart from the 303/4/20 PRow and the TUW/4/1 PRow, where there were no more than 70 and 150 people per day recorded respectively.
- 5.16.41 The number of users for each PRow surveyed is provided in the Baseline Survey Report in Annex B(iii).

### *Cycle facilities*

- 5.16.42 The location of PRow that will be affected by the Proposed Scheme, which include bridleways that can be used by cyclists, is provided in the Baseline Survey Report in Annex B(iii).

### *Equestrian facilities*

- 5.16.43 The location of PRow that will be affected by the Proposed Scheme, which include bridleways for use by equestrians, is provided in the Baseline Survey Report in Annex B(iii).

### **Waterways and canals**

- 5.16.44 No waterways or canals frequently used by waterborne craft and affected by the Proposed Scheme have been identified within the study area.

### **Air transport**

- 5.16.45 No airports have been identified within the study area.

## **5.17 Greatworth to Lower Boddington (CFA15)**

### **Study area**

- 5.17.1 This section provides an overview of the baseline traffic and transport conditions for the Greatworth to Lower Boddington CFA. It describes the transport infrastructure within the study area, which would be affected either by the construction or the operation of the Proposed Scheme.
- 5.17.2 The Proposed Scheme through the study area will be approximately 17km in length, commencing south-east of Halse Copse South near Radstone. The route will then proceed north in twin-bored tunnel, passing just east of Greatworth, and will emerge from tunnel to pass over Lower Thorpe on a viaduct.
- 5.17.3 It will continue north in cuttings and on embankments before passing west of Trafford Bridge (east of Edgcote) on a viaduct. It will then enter into twin-bored tunnel to pass east of Chipping Warden, emerging west of Aston Le Walls where it will cross over a viaduct before passing to the west of Lower Boddington in cuttings and on embankments.
- 5.17.4 The area is predominantly rural land, with agriculture being the main land use. Development is typically small villages and farmsteads. From south to north, villages within proximity of the route include Greatworth Thorpe Mandeville, Edgcote, Chipping Warden, Aston Le Walls, Lower Boddington and Upper Boddington.
- 5.17.5 The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFA15 Report).
- 5.17.6 The scope of this work has been discussed with OCC and NCC.
- 5.17.7 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from south to north along the proposed route.

### **Local land uses**

- 5.17.8 The route of the Proposed Scheme through the study area passes through predominantly rural land, with agriculture being the main land use. Development is typically small villages and isolated farmsteads. From south to north, villages within proximity of the route include Greatworth Thorpe Mandeville, Edgcote, Chipping Warden, Aston Le Walls, Lower Boddington and Upper Boddington.

## Surveys

5.17.9 Transport surveys have been undertaken to obtain baseline data in order to undertake an impact assessment of the Proposed Scheme. Traffic surveys, which in some cases included non-motorised user surveys, were undertaken in June and September 2012 and February 2013. Additionally, surveys specifically recording non-motorised users on PRoW were undertaken in August and September 2012.

5.17.10 Further details of the traffic and non-motorised user surveys and schedules for each survey undertaken are included in the Baseline Survey Report in Annex B(iii).

### *Traffic surveys*

5.17.11 Traffic surveys were undertaken to establish current traffic flows on the road network subject to assessment, during June and September 2012 and February 2013. The surveys comprised:

- automatic traffic counts (ATC) on highway links. ATC data was gathered for a continuous two week period; and
- classified turning count and queue length surveys at highway junctions. Surveys were undertaken on a weekday (Tuesday, Wednesday or Thursdays) between 07:00-10:00, and 16:00-19:00.

5.17.12 The survey data was further supplemented by traffic and transport data obtained from other sources where available, including from OCC and NCC.

### *Non-motorised user surveys*

5.17.13 PRoW surveys were undertaken in August and September 2012, to establish the nature of the PRoW and their usage by pedestrians, cyclists and equestrians (non-motorised users). The surveys included all PRoW and roads that will cross the Proposed Scheme and any additional PRoW that will be affected by the Proposed Scheme.

5.17.14 The August surveys were carried out between 08:00 and 18:00 on a Sunday to capture users of footpaths, bridleways and some country lanes, where they were identified as being on a National Trail or Long Distance Route. Surveys were undertaken during the summer holidays in order to record maximum recreational usage. September surveys were carried out between 07:00 and 19:00 on a weekday (Tuesday, Wednesday or Thursdays) to capture only users of roads and associated footways. Surveys were undertaken outside of the school holidays in order to record non-recreational usage, such as school and commuting users.



## Highway network

- 5.17.15 The main strategic roads and local roads affected by the Proposed Scheme are A422 (M40 to B4525 Banbury Lane), A361 Williamscoth Hill/Banbury Road/Byfield Road/Badby Road West (M40 to A45 Stefen Way), B4525 Banbury Lane (A422 to A43), Radstone Road (Radstone), Helmdon Road (Greatworth), Marston Road (Greatworth to B4525), Sulgrave Road (South of Banbury Road), Banbury Road (B4525 to Sulgrave Road), Banbury Lane (Banbury Road to Culworth), Wardington Road, Culworth Road (Chipping Warden), Appletree Road (Chipping Warden), Welsh Road (Trafford Bridge to Banbury Road), Banbury Road (Lower Boddington), Claydon Road (also known as Hill Road), and Claydon Road (also known as Boddington Road).
- 5.17.16 The Proposed Scheme crosses 11 roads within the study area.

### *Strategic road network*

#### **Primary 'A' roads**

- 5.17.17 The A422 is a predominantly single carriageway road between Bedford and Worcester, via Milton Keynes, Buckingham, Banbury and Stratford-upon-Avon. Within the study area, the A422 runs to the west of the Proposed Scheme

#### **Non-Primary 'A' roads**

- 5.17.18 The A361 is a single carriageway road between Devon to the vicinity of Rugby in Northamptonshire. Within the study area, the A361 Williamscoth Hill/Banbury Road/Byfield Road/Badby Road West runs south to north through the northern section of the area, linking the M40 at Banbury to Daventry in the east, via Chipping Warden where it intersects the Proposed Scheme.

### *Local road network*

- 5.17.19 Local roads, which are either intersected by, or impacted by the Proposed Scheme are:
- B4525 Banbury Lane (A422 to A43) (two-way single carriageway, which intersects the Proposed Scheme at Greatworth);
  - Radstone Road (Radstone) (two-way single carriageway);
  - Helmdon Road (Greatworth) (single carriageway with passing places);
  - Marston Road (Greatworth to B4525) (two-way single carriageway);
  - Sulgrave Road (South of Banbury Road) (two-way single carriageway);
  - Banbury Road (B4525 to Sulgrave Road) (two-way single carriageway);
  - Banbury Lane (Banbury Road to Culworth) (two-way single carriageway);

- Wardington Road (two-way single carriageway);
- Culworth Road (Chipping Warden) (two-way single carriageway);
- Appletree Road (Chipping Warden) (two-way single carriageway);
- Welsh Road (Trafford Bridge to Banbury Road) (two-way single carriageway);
- Banbury Road (Lower Boddington) (two-way single carriageway);
- Claydon Road (aka Hill Road) (two-way single carriageway); and
- Claydon Road (aka Boddington Road) (single carriageway with passing places).

### *Baseline conditions*

5.17.20 2012 base year traffic volumes on the roads subject to assessment have been derived from a combination of traffic surveys and traffic data obtained from other sources, where available.

5.17.21 The following volumes have been recorded:

- 24 hour average annual daily traffic (AADT) combined flows in number of vehicles, with proportions of heavy goods vehicles (HGVs);
- 12 hour average annual weekday traffic (AAWT) combined flows in number of vehicles, with proportions of HGVs; and
- AM (08:00-09:00) and PM (17:00-18:00) peak hour combined flows in number of vehicles, with proportions of HGVs.

Table 5-112: Greatworth to Lower Boddington 2012 baseline flows (vehicles)

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
Strategic road network					
A361 Byfield Road (south of Welsh Road, Chipping Warden)	NB	186	5	485	4
	SB	484	8	217	3
A361 Byfield Road (north of Welsh Road)	NB	186	5	485	4
	SB	484	8	217	3
B4525 Welsh Road (west of Greatworth)	EB	256	10	236	4
	WB	261	7	226	5
B4525 Banbury Lane (south-west of Banbury Lane, Thorpe Mandeville)	EB	330	11	394	5
	WB	445	8	303	5
B4525 Welsh Lane (Helmdon)	EB	234	9	220	4
	WB	217	7	190	4

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
Local road network					
Radstone Road (Radstone)	NB	74	0	95	1
	SB	119	1	61	0
Helmdon Road (Greatworth)	EB	37	1	12	0
	WB	10	0	27	0
Sulgrave Road (Thorpe Mandeville)	NB	64	1	87	0
	SB	106	1	55	0
Banbury Road (SW of Thorpe Mandeville) (Thorpe Mandeville)	EB	74	1	158	1
	WB	184	1	77	0
Banbury Road (Thorpe Mandeville)	EB	58	1	139	1
	WB	162	1	68	0
Banbury Lane (Thorpe Mandeville)	NB	17	0	20	0
	SB	22	0	10	0
Welsh Road (south of Trafford Bridge, Edgcote)	EB	46	1	42	1
	WB	37	0	37	0
Wardington Road (Edgcote)	EB	11	0	8	0
	WB	10	0	5	0
Welsh Road (north of Trafford Bridge, Edgcote)	NB	33	0	32	0
	SB	34	1	35	1
Culworth Road (Chipping Warden)	EB	8	0	16	0
	WB	18	0	10	0
Welsh Road (north west of Culworth Rd, Chipping Warden)	NB	33	0	32	0
	SB	34	1	35	1
Appletree Lane (Aston le Walls)	NB	7	0	13	0
	SB	13	0	7	0
Claydon Road (also known as Hill Road, Lower Boddington)	NB	7	0	9	0
	SB	10	0	8	0
Banbury Road (east of Claydon Road) (Lower Boddington)	NB	27	1	29	0
	SB	24	1	25	0

Location	Direction	2012 baseline flows			
		AM peak (08:00 – 09:00)		PM peak (17:00 – 18:00)	
		All vehicles	HGV	All vehicles	HGV
Claydon Road (also known as Boddington Road, Lower Boddington)	NB	6	0	12	0
	SB	9	0	7	0
Banbury Road (west of Claydon Road, Boddington)	NB	26	0	27	0
	SB	24	0	23	0
Claydon Road (north of Banbury Road, Boddington)	NB	8	0	10	0
	SB	7	1	8	0
Warwick Road (Boddington)	EB	22	0	91	0
	WB	79	3	34	2
Banbury Road (east of Stoneton Road) (Boddington)	EB	46	0	114	0
	WB	105	3	61	2
Wormleighton Road (Boddington)	EB	108	1	110	0
	WB	114	1	153	0
Stoneton Lane (Boddington)	NB	14	1	22	0
	SB	18	0	12	0
Marston Road (Greatworth)	NB	38	0	11	0
	SB	11	0	35	0
Appletree Road (Chipping Warden)	EB	27	2	143	1
	WB	112	2	31	0
Welsh Rd (south east of Aston le Walls)	NB	42	0	29	0
	SB	24	1	40	0
Welsh Rd (north west of Aston le Walls)	NB	42	0	29	0
	SB	24	1	40	0

5.17.22 Further information on 2012 baseline traffic data is provided in the Baseline Survey Report in Annex B(iii).

### Accidents and safety

5.17.23 Relevant accident data for the road network subject to assessment has been obtained from NCC and OCC for the three year period from 2009 to 2011.

5.17.24 The accident data has been interrogated and any clusters of nine or more accidents over a three year period, within 20m of a junction or within 150m on any sections of road between junctions, have been identified. No such accident clusters have been identified in the area.

## Parking and loading

- 5.17.25 Locations where existing public parking and loading will be potentially affected by the Proposed Scheme have been established from site observations and desktop review. This has confirmed that no public parking or loading in this study area will be affected by the Proposed Scheme during construction or operation and therefore baseline conditions have not be provided.

## Public transport

- 5.17.26 The following sections describe the rail, bus and coach services in the area.

### *Rail network*

- 5.17.27 There are no rail services that are affected by the Proposed Scheme in this area

### *Local bus services*

- 5.17.28 The following six public bus services operate along roads that were subject to assessment:
- route 508 – connecting Brackley to Bodicote and serving Greatworth, Helmdon, Culworth, Thorpe Mandeville, Banbury and Calthorpe;
  - route 200 – connecting Banbury to Daventry and serving Wardington, Chipping Warden, Byfield, and Badby;
  - route C88 – a demand responsive service covering Brackley, Middleton Cheney and Towcester areas;
  - route B500 – a demand responsive service covering the Northamptonshire and Oxfordshire areas; and
  - route C500 – a demand responsive service covering the Northamptonshire and Oxfordshire areas.
- 5.17.29 Route 508 operates along the B4525 Welsh Lane, Banbury Lane, and Helmdon Road on a one service a week basis. Route 200 operates along the A361 Williamscoth Hill/Banbury Road/Byfield Road/Badby Road West at a peak frequency of one bus an hour. The demand responsive services route B500 and route C500 operate along Banbury Road, Banbury Lane, Marston Road, Welsh Road, and Culworth Road as required, with a potential maximum combined peak frequency of two buses an hour.
- 5.17.30 The route B500 also operates along the A361 Williamscoth Hill/Banbury Road/Byfield Road/Badby Road West and Appletree Lane as required at a potential frequency of one bus an hour and the route C500 also operates along the B4525 Banbury Lane/Welsh Road and Helmdon Road as required at a potential frequency of one bus an hour. In addition to these, the demand responsive route C88 also operates along the B4525 Welsh Road.

### **Additional bus services**

- 5.17.31 Moulton College is understood to operate a network of subsidised minibuses and coaches, offering transport to students from most parts of Northamptonshire and some parts of neighbouring counties. These include.
- Moulton: 17 routes;
  - South Northants Vocational Skills Academy (Silverstone): three routes;
  - East Northants Vocational Skills Academy (Rushden): three routes; and
  - Daventry: one route.
- 5.17.32 All routes operate once a day to from their respective campus' and have been timetabled to arrive at 08:50 hours and depart at 17:20 hours. Routes crossing the proposed alignment of the Proposed Scheme within the Greatworth to Lower Boddington area include:
- route 4 (Moulton) via the A361 including Banbury, Chipping Warden and Byfield; and
  - route S3 (South Northants Vocational Skills Academy) via the A361 including Banbury, Middleton Cheney & Chipping Warden.

### *Coach services*

- 5.17.33 Coach services most frequently operate along Primary 'A' roads, but also operate on a less frequent basis on other roads within the study area.

### *Public transport interchanges*

- 5.17.34 Public interchanges within the study area include bus stops serving the routes listed above. No further public transport interchanges of significance have been identified within the study area.

### **Pedestrians, cyclists and equestrians**

- 5.17.35 PRoW provide links between settlements in the area. The Proposed Scheme crosses PRoW in 36 locations within the study area. In addition to the 36 PRoW, the Proposed Scheme crosses 11 roads.

### *Pedestrian facilities*

- 5.17.36 Notable PRoW within the study area are:
- The Macmillan Way (a 467km route between Boston in Lincolnshire and Abbotsbury in Dorset) intersects the Proposed Scheme at Chipping Warden;
  - The Battlefields Trail (a 32km route between Chipping Warden and Kineton in Warwickshire) which intersects the Proposed Scheme between Thorpe Mandeville and Chipping Warden;
  - The Millennium Way (a 161km route between Middleton Cheney and Pershore)



which intersects the Proposed Scheme at three locations - twice between Thorpe Mandeville and Chipping Warden, and once at Lower Boddington; and

- The Jurassic Way (a 142km route between Banbury and Stamford in Lincolnshire) which intersects the Proposed Scheme at Chipping Warden.

5.17.37 There are numerous other PRow in the area for recreational use, with some also providing connections between settlements in the area. The Baseline Survey Report in Annex B(iii) provides more details on these PRow.

### **Non-motorised user flows**

5.17.38 PRow surveys were undertaken in August and September 2012, to establish the nature of the PRow and their usage by non-motorised users. The surveys included all PRow and roads that will cross the Proposed Scheme, and any additional PRow that will be affected by the Proposed Scheme.

5.17.39 The surveys indicated that the majority of the roads, footpaths, bridleways and cycleways crossing the route are used by no more than 10 people per day with the exception of Appletree Lane and Culworth Road which were all used by no more than 30 people per day, PRow AC1 which was used by no more than 60 people per day, and Claydon Road (aka Hill Road) which was used by no more than 150 people per day.

5.17.40 The number of users for each PRow surveyed is provided in the Baseline Survey Report in Annex B(iii).

### *Cycle facilities*

5.17.41 The location of PRow that will be affected by the Proposed Scheme, which include bridleways that can be used by cyclists, is provided in the Baseline Survey Report in Annex B(iii).

### *Equestrian facilities*

5.17.42 The location of PRow that will be affected by the Proposed Scheme, which include bridleways for use by equestrians, is provided in the Baseline Survey Report in Annex B(iii).

### **Waterways and canals**

5.17.43 No waterways or canals frequently used by waterborne craft and affected by the Proposed Scheme have been identified within the study area.

### **Air transport**

5.17.44 No airports have been identified within the study area.

## 5.18 Ladbroke and Southam (CFA16)

### Study area

- 5.18.2 This section provides an overview of the baseline traffic and transport conditions for the section of the Proposed Scheme that passes through the Ladbroke and Southam area.
- 5.18.3 It describes the transport infrastructure within the area, which will be affected either by the construction or operation of the Proposed Scheme. The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFA16 Report).
- 5.18.4 The scope of work and study area has been discussed with the key transport authorities including Warwickshire County Council (WCC) and the HA.
- 5.18.5 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from south to north along the proposed route.

### Local land uses

- 5.18.6 The study area is predominantly rural in character. Southam is the principal settlement broadly in the centre of the area and lies approximately 800m to the east of the Proposed Scheme.

### Surveys

- 5.18.7 Traffic, non-motorised user and waterway surveys were undertaken between June and July 2012, with additional surveys undertaken in May and June 2013. Summarised survey data and locations can be found in the Baseline Survey Report in Annex B(iv).

### Traffic surveys

- 5.18.8 Traffic flow data have been collected through the following types of surveys:
- MCC - surveys at highway junctions, to identify the existing traffic demand and turning profiles at the key junctions, located within the study area;
  - ATC - surveys to establish the existing link traffic volumes along the highway routes forming the study area; and
  - queue length surveys – to coincide with the junction surveys such that this data could be used in combination with the demand information to assist model calibration as necessary.
- 5.18.9 The traffic survey data have been further supplemented by transport data obtained from other sources where available, including from the HA and survey information held by the local authorities.

- 5.18.10 The traffic data showed that for the study area the weekday AM peak hour is 08:00–09:00 and the PM peak hour is 17:00–18:00.

#### *Non-motorised user surveys*

- 5.18.11 Non-motorised user surveys were undertaken in August and September 2012, with additional surveys undertaken in May and June 2013, to establish the usage of PRow including roads, in the area of the Proposed Scheme. As appropriate to their role, these surveys covered weekday and weekend use. The surveys included:

- all roads and associated footways intersected by the Proposed Scheme; and
- green corridors including footpaths, cycleways, bridleways, river and canal paths.

#### *Waterway surveys*

- 5.18.12 Surveys of waterways have been undertaken in July 2013 in order to establish the usage of boats on navigable canals in the study area. Within the Ladbroke and Southam area there is one navigable waterway located, Oxford Canal.

#### **Highway network**

##### *Strategic road network*

- 5.18.13 There are no strategic roads that pass through the Ladbroke and Southam area.

##### **Primary 'A' roads**

- 5.18.14 The following 'A' roads are either intersected by or impacted by the Proposed Scheme in the Ladbroke and Southam area:
- A423 Banbury Road is a single carriageway 'A' road, which runs in a south/north direction and connects Banbury in the south with Coventry in the north; and
  - A425 Leamington Road is a single carriageway 'A' road, which runs in a broadly west/east direction and links Leamington Spa in the west with Southam in the east.

##### *Local road network*

- 5.18.15 Roads classified within the local road network, which are either intersected by or impacted by the Proposed Scheme are:
- B4451 Kineton Road, which has a south-west/north-east alignment;
  - Wormleighton Road, which has in this area an east/west alignment and passes through the village of Wormleighton;
  - Stoneton Lane, which has a broadly south/north alignment connects in this area Banbury Road in the south with the village of Priors Hardwick in the

north;

- Windmill Lane, which has a broadly west/south-east alignment runs through the village of Ladbroke in the west and leads to Ladbroke Hill Farm in the south-east; and
- Welsh Road, which will not be intersected by the Proposed Scheme but will be utilised by construction vehicles. This road runs in a broadly south-east/north-west alignment and passes through Southam.

### *Baseline conditions*

5.18.16 The baseline traffic flow conditions have been identified using the survey flows, these have been summarised for the study area in Table 5-113.

Table 5-113: Ladbroke and Southam 2012 baseline flows (vehicles)

Location	Direction	2012 baseline – AM peak		2012 baseline - PM peak	
		All vehicles	HGV	All vehicles	HGV
A423 Banbury Road, between Banbury and Wormleighton Road	NB	297	33	594	32
	SB	596	46	342	19
A423 Banbury Road, between Southam and Ladbroke	NB	284	29	346	28
	SB	316	34	289	17
A425 Leamington Road, between junction with B4452 and junction with B4451	NB	602	45	422	26
	SB	355	39	544	21

5.18.17 A total of twelve junctions have been identified as having potential to be substantially affected by the Proposed Scheme, these include:

- A425 Leamington Road/A423 Banbury Road;
- A425 Daventry Road/A423 Banbury Road;
- A425 Daventry Road/Welsh Road east;
- A423 Banbury Road/Glebe Farm Access;
- A423 Southam Road/Dukes Meadow Drive/Noral Way;
- A423 Southam Road/A422 Ruscote Avenue/Hennef Way;
- A422 Hennef Way/A4260 Concord Avenue;
- A422 Hennef Way/Ermont Way/Wildmere Road;
- M40 junction 11;
- A425 Leamington Road/B4452;
- A425 Leamington Road/B4451 Kineton Road; and

- A425 Southam Road/B4455 Fosse Way.

5.18.18

The following tables summarise the 2012 baseline performance of those junctions outlined above that operate over capacity, in the AM peak hour.

Table 5-114: 2012 baseline performance at the A422 Hennef Way/Ermont Way/Wildmere Road junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
Wildmere Road	169	14%	0	733	67%	2
A422 Hennef Way (E)	2,660	100%	39	1,788	73%	3
Ermont Way	744	97%	14	908	77%	3
A422 Hennef Way (W)	1,999	75%	3	1,553	55%	1

Table 5-115: 2012 baseline performance at the M40 junction 11

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
M40 (N)	693	66%	5	515	64%	4
A361 Williamscot Hill	619	61%	3	355	41%	3
A422 (E)	1435	90%	15	908	56%	6
M40 (S)	614	103%	15	773	64%	5
A422 Hennef Way (W)	869	55%	3	1917	82%	5

5.18.19

Table 5-114 and Table 5-115 above show that A422 Hennef Way/Ermont Way/Wildmere Road and M40 junction 11 operate close to or over capacity on at least two junction arms in the AM peak hour.

5.18.20

Although currently operating with spare capacity, Table 5-116 and Table 5-117 represent junctions that are approaching flow/capacity ratio of 85% on at least one junction arm within the AM or PM peak.

Table 5-116: 2012 baseline performance at the A423 Southam Road/A422 Ruscote Avenue/Hennef Way junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
A423 Southam Road	836	49%	1	770	48%	1
A422 Hennef Way	1,360	67%	2	1,492	76%	3
A361 Southam Road	543	41%	1	714	62%	2
A422 Ruscote Avenue	892	53%	1	907	56%	1

Table 5-117: 2012 baseline performance at the A422Hennef Way/A4260 Concord Avenue junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
Unclassified Road	30	8%	0	30	6%	0
A422 Hennef Way (E)	2,221	75%	3	1,771	59%	1
A4260	665	43%	1	911	56%	1
A422 Hennef Way (W)	1,631	76%	3	1,119	55%	1

- 5.18.21 The remaining eight junctions are estimated to operate with spare capacity in both the AM and PM peaks.

### Accidents and safety

- 5.18.22 Relevant accident data for the road network subject to assessment has been obtained from WCC for all accidents that occurred between June 2009 and June 2012.
- 5.18.23 Within the Ladbroke and Southam area, a total of six accidents occurred over the three year period, of which five (83%) were recorded as slight, one (17%) as serious and none as fatal.
- 5.18.24 Within this area, no locations have been identified over a three year period where there are substantial clusters of accidents.

### Public transport

#### Rail network

- 5.18.25 Within this area there are no existing national or local rail services situated.

### Local bus services

- 5.18.26 There are four public bus services, route numbers 503, 63, 64 and 65, which pass through the Ladbroke and Southam area. The bus services provide connections to Long Itchington, Southam, Banbury, Rugby, Leamington and Daventry. These services provide a combined maximum service frequency of four buses per hour between Monday and Friday.
- 5.18.27 The following table shows the bus route numbers, their service frequency as well as the road on which the Proposed Scheme will intersect with the bus services.

Table 5-118: Bus Services Frequencies in CFA16

Bus Route Number (s)	Frequency of Service	Road Name
503	One/day, Thursdays only	B4451 Kineton Road
63,64,65,66	At least every 2 hours Monday to Saturday	A425 Leamington Road

### Pedestrians, cyclists and equestrians

- 5.18.28 A total of 10 PRoW and two E-roads will cross the route of the Proposed Scheme within the Ladbroke and Southam area. The usages of these have been identified and nine of the routes were used by less than 10 people a day. The routes with the greatest usage are shown in the following table. Results for all PRoW surveys can be found in Annex B(iv).

Table 5-119: PRoW locations and references (CFA16)

Description of location	PRoW Reference	Usage per day
Link from Leamington Road (Opposite Banbury Road) into Starbold Farm	SM33	23
Link from Leamington Road (Near Thorpe Bridge)	SM24	26
Link from Bascote Road eastbound	SM19	18

### Waterways/canals

- 5.18.29 There are three waterways situated within the Ladbroke and Southam area, the Oxford Canal, River Itchen and Grand Union Canal, of which the Grand Union Canal marks the northern boundary of the Ladbroke and Southam area. These three waterways will intersect with the Proposed Scheme. Of those, Oxford Canal and Grand Union Canal are navigable by boat.
- 5.18.30 The impacts of the Proposed Scheme on the usage of the Grand Union Canal are outlined in the Offchurch and Cubbington area section (CFA17). The usage of Oxford Canal has been identified during surveys undertaken as approximately seven boats per hour.

### Air transport

- 5.18.31 No airports have been identified within the study area.



## 5.19 Offchurch and Cubbington (CFA17)

### Study area

- 5.19.2 This section provides an overview of the baseline traffic and transport conditions for the section of the Proposed Scheme that passes through the Offchurch and Cubbington area.
- 5.19.3 It describes the transport infrastructure within the area, which will be affected either by the construction or by the operation of the Proposed Scheme. The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFA17 Report).
- 5.19.4 The scope of work and study area has been discussed with the key transport authorities including WCC and the HA.
- 5.19.5 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from south to north along the proposed route.

### Local land uses

- 5.19.6 The area is predominantly rural in character, with agriculture being the main land use, interspersed with small villages and a scattering of isolated dwellings and farmsteads. The edge of Leamington Spa lies approximately 2km to the west of the Proposed Scheme. The village of Offchurch is approximately 800m west of the Proposed Scheme. Cubbington is the largest village in the area and is approximately 600m west of the Proposed Scheme.

### Surveys

- 5.19.7 Traffic, non-motorised user and waterway surveys were undertaken between June and July 2012, with additional surveys undertaken in May and June 2013 and the survey locations are shown in Annex B(iv), together with the summarised survey data.

### *Traffic surveys*

- 5.19.8 Traffic flow data have been collected through the following types of surveys:
- MCC - surveys at highway junctions, to identify the existing traffic demand and turning profiles at the key junctions, located within the study area;
  - ATC - surveys to establish the existing link traffic volumes along the highway routes forming the study area; and
  - queue length surveys – to coincide with the junction surveys such that this data could be used in combination with the demand information to assist model calibration as necessary.

- 5.19.9 The traffic survey data have been further supplemented by transport data obtained from other sources where available, including from the HA and survey information held by the local authorities.
- 5.19.10 The traffic data showed that for the study area the weekday AM peak hour is 08:00-09:00 and the PM peak hour is 17:00-18:00.

#### *Non-motorised user surveys*

- 5.19.11 Non-motorised user surveys were undertaken in August and September 2012, with additional surveys undertaken in May and June 2013, to establish the usage of PRow including roads, in the area of the Proposed Scheme. As appropriate to their role, these surveys covered weekday and weekend use. The surveys included:
- all roads and associated footways intersected by the Proposed Scheme; and
  - green corridors including footpaths, cycleways, bridleways, river and canal paths.

#### *Waterway surveys*

- 5.19.12 Surveys of waterways have been undertaken in July 2013 in order to establish the usage of boats on navigable canals in the study area.
- 5.19.13 Within the Offchurch and Cubbington area there is one navigable waterway located, Grand Union Canal.

### **Highway network**

#### *Strategic road network*

- 5.19.14 There are no strategic routes that pass through the area.

#### *Local road network*

- 5.19.15 The main local roads affected by the Proposed Scheme are as follows:
- Welsh Road, which runs through the whole of the area in a south-east to north-west alignment;
  - the B4455 Fosse Way, which runs in a south-west to north-east direction starting in Halford in the south and ending at its junction with the A5 in the north;
  - Long Itchington Road, which runs from Radford Semele in the west of Offchurch to the B4455 Fosse Way in the east of Offchurch;
  - Hunningham Road, which runs broadly parallel to the B4455 Fosse Way connecting Offchurch with Hunningham;
  - the B4453 Rugby Road, which runs through Cubbington in the west and ends at its junction with Weston Lane in the east; and

- Coventry Road, which runs in a broadly south to north direction starting in Cubbington and ending to the east of Stoneleigh.

### *Baseline conditions*

- 5.19.16 The baseline traffic flow conditions have been identified using the survey flows, these have been summarised for the study area in Table 5-120.

Table 5-120: Offchurch and Cubbington 2012 baseline flows (vehicles)

Location	Direction	2012 baseline – AM peak		2012 baseline - PM peak	
		All vehicles	HGV	All vehicles	HGV
Welsh Road, between the Grand Union canal and the B4455 Fosse Way	NB	74	2	46	2
	SB	52	2	65	2
Welsh Road, between the B4455 Fosse Way and Hunningham Road	EB	150	8	132	5
	WB	145	7	170	8
B4455 Fosse Way, between appr 170m north of Long Itchington Road and Welsh Road	NB	205	20	548	17
	SB	505	25	221	12
Hunningham Road, between Welsh Road and Fields Farm Cottages access track	NB	2	0	14	1
	SB	8	0	9	0

- 5.19.17 A total of four junctions have been identified as having potential to be significantly affected by the Proposed Scheme, these include:

- B4455 Fosse Wat/Welsh Road;
- A452 Banbury Road/Warwick Bypass/Europa Way;
- Welsh Road/Long Itchington Road; and
- B4455 Fosse Way/Long Itchington Road

- 5.19.18 These four junctions all operate with spare capacity within the AM and PM peak. However the A452 Banbury Road/Warwick Bypass/Europa Way, shown in Table 5-121, is approaching a flow/capacity value of 85% ratio on at least one arm (Warwick Bypass(E) – westbound).

Table 5-121: 2012 baseline performance at the A452 Banbury Road/Warwick Bypass/Europa Way

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
A425 (N) South Bound	214	15%	0	244	25%	0
A452 Europa Way(W) East Bound	1,025	74%	3	51	70%	2
Banbury Road (S) North Bound	798	62%	2	622	58%	1
Warwick-By-Pass(E) West Bound	1,132	81%	4	145	53%	1

## Accidents and safety

- 5.19.19 Relevant accident data for the road network subject to assessment has been obtained from WCC for all accidents that occurred between June 2009 and June 2012.
- 5.19.20 Within the Offchurch and Cublington area, a total of nine accidents occurred over the three year period, of which six (67%) were recorded as slight, three (33%) as serious and none (0%) as fatal. The table below shows the accidents by year and severity.

Table 5-122: Severity of accidents by year within the Offchurch and Cublington area

Year	Slight	Serious	Total
2009	1	3	4
2010	1	0	1
2011	4	0	4
Total	6	3	9

- 5.19.21 Within this area, no locations have been identified over a three year period where there are clusters of accidents.

## Public transport

### Rail network

- 5.19.22 Within this area there are no existing national or local rail services situated.

### Local bus services

- 5.19.23 There are two public bus services, route number 538 and 69, which pass through the Offchurch and Cubbington area. The bus services provide connections to Lillington, Cubbington, Leamington Spa, Princethorpe, Hunningham and Offchurch. These services provide a maximum combined service frequency of seven buses per day between Monday and Friday.
- 5.19.24 The following table shows the bus route numbers, their service frequency as well as the road on which the Proposed Scheme will intersect with the bus services.

Table 5-123: Bus Services Frequencies in CFA17

Bus Route Number (s)	Frequency of Service	Road Name
538	One/day, Wednesdays only	Hunningham Road
69	4 - 6 services a day (Monday – Saturday)	B4453 Rugby Road

### Pedestrians, cyclists and equestrians

- 5.19.25 A total of six PRoW and one E-road will cross the route of the Proposed Scheme within the Offchurch and Cubbington area. The usages of these have been identified and four of the routes were used by less than 10 people a day. The routes with the greatest usage are shown in the following table.

Table 5-124: PRoW locations and references (CFA17)

Description of location	PRoW Reference	Usage per day
Sutton Spinney, Offchurch	W192	51
Link road north of Offchurch (Opposite Valley Fields House)	W129d	59

- 5.19.26 Results for all PRoW surveys can be found in Annex B(iv).

### Waterways/canals

- 5.19.27 There are two waterways situated within the Offchurch and Cubbington area, the Grand Union Canal and River Liam. Both will intersect with the Proposed Scheme. Only the Grand Union Canal is navigable by boat. The usage of four boats per day has been identified following surveys.

### Air transport

- 5.19.28 No airports have been identified within the study area.

## 5.20 Stoneleigh, Kenilworth and Burton Green (CFA18)

### Study area

- 5.20.2 This section provides an overview of the baseline traffic and transport conditions for the section of Proposed Scheme that passes through the Stoneleigh, Kenilworth and Burton Green area.
- 5.20.3 It describes the transport infrastructure within the area, which will be affected either by the construction or by the operation of the Proposed Scheme. The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFA18 Report).
- 5.20.4 The scope of work and study area has been discussed with the key transport authorities including WCC and the HA.
- 5.20.5 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from south to north along the proposed route.

### Local land uses

- 5.20.6 The Stoneleigh, Kenilworth and Burton Green area is partially rural and partially urban. The central section of the area is mainly urban, consisting of Kenilworth. The outer areas of this CFA are predominantly rural in nature.

### Surveys

- 5.20.7 Traffic, non-motorised user and waterway surveys were undertaken between June and July 2012, with additional surveys undertaken in May and June 2013 and the survey locations are shown in Annex B(iv), together with the summarised survey data.

### *Traffic surveys*

- 5.20.8 Traffic flow data have been collected through the following types of surveys:
- MCC - surveys at highway junctions, to identify the existing traffic demand and turning profiles at the key junctions, located within the study area;
  - ATC - surveys to establish the existing link traffic volumes along the highway routes forming the study area; and
  - queue length surveys – to coincide with the junction surveys such that this data could be used in combination with the demand information to assist model calibration as necessary.
- 5.20.9 The traffic survey data have been further supplemented by transport data obtained from other sources where available, including from the HA and survey information held by the local authorities.

- 5.20.10 The traffic data showed that for the study area the weekday AM peak hour is 08:00 – 09:00 and the PM peak hour is 17:00 - 18:00.

#### *Non-motorised user surveys*

- 5.20.11 Non-motorised user surveys were undertaken in August and September 2012, with additional surveys undertaken in May and June 2013, to establish the usage of PRow including roads, in the area of the Proposed Scheme. As appropriate to their role, these surveys covered weekday and weekend use. The surveys included:

- all roads and associated footways intersected by the Proposed Scheme; and
- green corridors including footpaths, cycleways, bridleways, river and canal paths.

#### **Highway network**

##### *Strategic road network*

##### **Motorway network**

- 5.20.12 There are no motorways situated within the study area.

##### **Primary 'A' roads**

- 5.20.13 There is one strategic route that passes through the area. The A46 Kenilworth Bypass (dual-carriageway) travels in a south-west/north-east direction and is accessed in the area via the A46/A452 Kenilworth Road/Leamington Road roundabout and from the B4113 Stoneleigh Road.

##### **Non-Primary 'A' roads**

- 5.20.14 The following 'A' roads will be affected by the Proposed Scheme:
- A445 Leicester Lane is a single carriageway 'A' road, which runs in a south-west/north-east direction and connects Cubbington in the south-west with Bubbenhall in the north-east; and
  - A429 Kenilworth Road is a single carriageway 'A' road, which has a roughly south/north alignment and connects Kenilworth with Coventry.

#### *Local road network*

- 5.20.15 The main local roads affected by the Proposed Scheme are as follows:
- Stareton Road, which has a broadly west/east alignment and links the village of Stareton with the B4113 Stoneleigh Road in the west and Coventry Road in the east;
  - B4113 Stoneleigh Road, which travels in a broadly south/north direction and provides a link between Blackdown, Stareton and Coventry;
  - B4115 Coventry Road, which runs broadly parallel to the B4113 Stoneleigh Road and provides access to the A46 Kenilworth Bypass in the south-west and



joins the B4113 Stoneleigh Road just outside Coventry;

- Dalehouse Lane, which travels broadly in a west/east direction and connects Kenilworth in the west with Stoneleigh Road in the east;
- Crackley Lane, which runs in a south/north direction connecting several farms;
- Cromwell Lane, which travels in a roughly south/north direction and leads into the western outskirts of Coventry; and
- B4101 Waste Lane, which has a broadly west/east alignment and lies in the south of Balsall Common.

### *Baseline conditions*

5.20.16 The baseline traffic flow conditions have been identified using the survey flows, these have been summarised for the study area in Table 5-125.

Table 5-125: Stoneleigh, Kenilworth and Burton Green 2012 baseline flows (vehicles)

Location	Direction	2012 baseline – AM peak		2012 baseline - PM peak	
		All vehicles	HGV	All vehicles	HGV
Strategic road network					
A46 Kenilworth Bypass, between Stoneleigh Road and Leamington Road	NB	3,304	135	2,981	114
	SB	3,101	113	2,676	81
Local road network					
A445 Leicester Lane, between Coventry Road and Westhill Road	NB	418	30	512	30
	SB	611	27	402	7
B4113 Stoneleigh Road, between Coventry Road and Bericote Road/Westhill Road	NB	777	21	447	11
	SB	472	22	550	10
Dalehouse Lane, between Stoneleigh Road and Common Lane	EB	481	20	253	9
	WB	326	19	341	8
A429 Kenilworth Road, between Kenilworth and Gibbet Hill Road/Stoneleigh Road	NB	284	29	346	28
	SB	316	34	289	17

5.20.17 The following junctions have been identified as having potential to be significantly affected by the Proposed Scheme, these include:

- B4101(Waste Lane/Windmill Lane;
- A452 Kenilworth Road/B4101 Kelsey Lane;
- A46 Kenilworth Bypass/A452 Leamington Road;
- A45/A453 Kenilworth Road;
- M40/A46 Kenilworth Bypass;
- A452 Kenilworth Road/B4115;
- Dalehouse Lane/Stoneleigh Road;
- A429 Kenilworth Road/Gibbett Hill Road/Stoneleigh Road;
- Cornets End Lane/B4102 Meriden Road/A452 Kenilworth Road;
- A445 Leicester Lane/Kenilworth Road;
- B4113 Stoneleigh Road/Westhill Road/Bericote Road;
- A452 Kenilworth Road/Bericote Road; and
- Stoneleigh Road/A46 Kenilworth Bypass.

5.20.18 The following tables summarise the 2012 baseline performance of those junctions outlined above that operate close to or over capacity, in the AM and/or PM peak hours.

Table 5-126: 2012 baseline performance at the A45/A452 Kenilworth Road junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/ capacity %	Max queue	Flow (all PCU)	Flow/ capacity %	Max queue
A452 Chester Road	2,080	96%	17	2,373	108%	101
A45 Birmingham Road	607	51%	1	522	44%	1
A452 Kenilworth Road	1,117	64%	2	1,179	69%	2
A45 Coventry Road	1371	67%	2	1,055	52%	1

Table 5-127: 2012 baseline performance at the A429 Kenilworth Road/Gibbett Hill Road/Stoneleigh Road junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
A429 Kenilworth Road (east)	569	68%	13	549	90%	20
Stoneleigh Road	744	87%	26	544	88%	13
A429 Kenilworth Road (west)	742	88%	25	387	61%	10
Gibbet Hill Road (north)	600	75%	18	954	84%	28

5.20.19 Although currently operating with spare capacity, the following tables represent junctions that are approaching a flow/capacity ratio of 85% on at least one junction arm within the AM or PM peak.

Table 5-128: 2012 baseline performance at the A452 Kenilworth Road/B4101 Kelsey Lane priority junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
B4101 Kelsey Lane (east)	132	65%	4	302	81%	9
A452 Kenilworth Road (south)	535	60%	11	637	72%	14
A4101 Alder Lane (west)	271	73%	8	158	77%	5
A452 Kenilworth Road (north)	507	59%	10	642	75%	15

Table 5-129: 2012 baseline performance at the A46 Kenilworth Bypass/A452 Leamington Road junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
A46 (north east)	679	46%	1	807	51%	1
Leamington Road	1,060	66%	2	1,195	76%	3
A46 (south west)	621	40%	1	633	45%	1
Leamington Road	917	65%	2	724	50%	1

Table 5-130: 2012 baseline performance at the A445 Leicester Lane/Kenilworth Road junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/ capacity %	Max queue	Flow (all PCU)	Flow/ capacity %	Max queue
A445 Leicester Lane (NE)	620	56%	1	457	47%	1
Kenilworth Road	581	72%	2	303	34%	1
A445 Leicester Lane (SW)	660	74%	3	625	56%	1
Westhill Road	333	31%	0	594	54%	1

Table 5-131: 2012 baseline performance at the B4113 Stoneleigh Road/Westhill Road/Bericote Road junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/ capacity %	Max queue	Flow (all PCU)	Flow/ capacity %	Max queue
B4113 Stoneleigh Road	525	42%	1	516	45%	1
Westhill Road	745	64%	2	395	32%	1
B4113 Stoneleigh Road	383	39%	1	356	33%	1
Bericote Road	440	43%	1	439	40%	1

Table 5-132: 2012 baseline performance at the A452 Kenilworth Road/Bericote Road junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/ capacity %	Max queue	Flow (all PCU)	Flow/ capacity %	Max queue
A452 Kenilworth Road North	1,543	80%	4	1,425	74%	3
Bericote Road	465	46%	1	486	44%	1
A452 Kenilworth Road South	845	61%	2	917	66%	2
Hotel/Farm Access	12	3%	0	9	3%	0

5.20.20 The remaining junctions outlined above all operate within capacity in the AM and PM peak hours.

## Accidents and safety

5.20.21 Relevant accident data for the road network subject to assessment has been obtained from WCC for all accidents that occurred between June 2009 and June 2012.

5.20.22 Within the Stoneleigh, Kenilworth and Burton Green area, a total of 11 accidents occurred over the three year period, all of which were of slight severity, as shown in the table below.

Table 5-133: Severity of accidents by year within the Stoneleigh, Kenilworth and Burton Green area

Year	Slight
2009	2
2010	5
2011	4
Total	11

5.20.23 Within this area no locations have been identified where there are clusters of accidents.

## Public Transport

### *Rail Network*

5.20.24 Local rail services are accessible via Leamington Spa station and Coventry station. Both railway stations are located slightly outside the boundary of this study area, to the south and north respectively, providing access to local services between Coventry and Leamington Spa.

### *Local Bus Services*

5.20.25 There are 12 public bus services, route numbers 548, X15, X18, U1, U12, X17, U2, U17, 11, 16, 539 and 87, passing through the Stoneleigh, Kenilworth and Burton Green area. The bus services provide connections to Leamington Spa, Coventry, Warwick, Stratford, Balsall Common and Kenilworth. These services provide a combined maximum service frequency of approximately 20 buses per hour between Monday and Friday.

5.20.26 The following table shows the bus route numbers, their service frequency as well as the road on which the Proposed Scheme will intersect with the bus services.

Table 5-134: Bus Services Frequencies in CFA17

Bus Route Number (s)	Frequency of Service	Road Name
548	One/day, Wednesdays only	B4115 Coventry Road
X15, X18	approximately one/hour on each service (Monday - Saturday)	A46 Kenilworth Bypass
U1, U12	62-64 daily services (Monday – Friday), 12-18 services (Saturday), 3-4 (Sunday)	A46 Kenilworth Bypass
X17	approximately four/hour (Monday – Friday)	A429 Kenilworth Road
U2	approximately 3/hour, only Saturdays	A429 Kenilworth Road
U17	approximately 3/hour, only Sundays	A429 Kenilworth Road
11	35-36 daily services (Monday – Friday), 29-30 (Saturday), 15 (Sunday)	A429 Kenilworth Road
16	11 daily services (Monday – Friday), 10 (Saturday)	A429 Kenilworth Road
539	5 daily services (Monday – Saturday)	Dalehouse Lane
87	12 daily services (Monday – Saturday)	Cromwell Lane

## Pedestrians, cyclists and equestrians

- 5.20.27 A total of 13 PRoW will cross the route of the Proposed Scheme within the Stoneleigh, Kenilworth and Burton Green area. The usages of these have been identified and six of the routes were used by less than 10 people a day, with the usage of the remaining routes varying between 10 and 552. The routes with the greatest usage are shown in the following table.

Table 5-135: PRoW locations and references (CFA18)

Description of location	PRoW Reference	Usage per day
Kenilworth Greenway	-	552
Link from Cryfield Grange Road southbound (opposite Birches Wood Farm)	W165x	198

- 5.20.28 Results for all PRoW surveys can be found in Annex B(iv).

## Waterways/canals

- 5.20.29 There are no navigable waterways in the area.

## Air transport

- 5.20.30 No airports have been identified within the study area. However Birmingham International Airport is located approximately 18km from Kenilworth, in CFA24.

## 5.21 Coleshill Junction (CFA19)

### Study area

- 5.21.2 This section provides an overview of the baseline traffic and transport conditions for the section of the Proposed Scheme that passes through the Coleshill Junction area.
- 5.21.3 It describes the transport infrastructure within the area, which will be affected either by the construction or by the operation of the Proposed Scheme. The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFA19 Report).
- 5.21.4 The scope of work and study area has been discussed with the key transport authorities including WCC and the HA.
- 5.21.5 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from south to north along the proposed route.

### Local land uses

- 5.21.6 The Coleshill Junction area is broadly split into two halves, east and west, divided by the M<sub>42</sub>. The eastern part comprises the urban area of Coleshill which is surrounded by a rural area, whereas the western part of the Coleshill Junction area is predominantly urban, formed by the outskirts of Birmingham and neighbouring towns.

### Surveys

- 5.21.7 Traffic, non-motorised user and waterway surveys were undertaken between June and July 2012, with additional surveys undertaken in May and June 2013 and the survey locations are shown in Annex B(iv), together with the summarised survey data.

### *Traffic surveys*

- 5.21.8 Traffic flow data have been collected through the following types of surveys:
- MCC - surveys at highway junctions, to identify the existing traffic demand and turning profiles at the key junctions, located within the study area;
  - ATC - surveys to establish the existing link traffic volumes along the highway routes forming the study area; and
  - queue length surveys – to coincide with the junction surveys such that this data could be used in combination with the demand information to assist model calibration as necessary.
- 5.21.9 The traffic survey data have been further supplemented by transport data obtained from other sources where available, including from the HA and survey information held by the local authorities.



- 5.21.10 The traffic data showed that for the study area the weekday AM peak hour is 08:00 to 09:00 and the PM peak hour is 17:00 to 18:00.

#### *Non-motorised user surveys*

- 5.21.11 Non-motorised user surveys were undertaken in August and September 2012, with additional surveys undertaken in May and June 2013, to establish the usage of PRow including roads, in the area of the Proposed Scheme. As appropriate to their role, these surveys covered weekday and weekend use. The surveys included:

- all roads and associated footways intersected by the Proposed Scheme; and
- green corridors including footpaths, cycleways, bridleways, river and canal paths.

#### **Highway network**

##### *Strategic road network*

##### **Motorway network**

- 5.21.12 There are several motorways that pass through the area, including:
- the M6, which travels in a broadly south/north direction within this area and is accessed in this area via the A446 Stonebridge Road/M6 Slip Road roundabout and via the M42 junctions 7 and 8;
  - the M6 Toll, which passes through the north/eastern corner of this area, where it joins the M42; and
  - the M42, which travels broadly parallel to the M6 and thus has also a south/north alignment and is accessed within this area via the M6 junctions 4 and 8.

##### **Primary 'A' roads**

- 5.21.13 The only primary 'A' road affected by the Proposed Scheme within this area is the A446 Lichfield Road, which runs through the CFA from south to north on the western side of Coleshill and provides access to the M6 and M42.

##### *Local road network*

- 5.21.14 The main local roads affected by the Proposed Scheme in this area include:
- Coleshill Heath Road, which connects Chelmsley Wood in the south-west with Coleshill in the north-east;
  - B4114 Birmingham Road, which links the neighbourhood of Kingshurst in the west with Coleshill in the east;
  - Gilson Drive, which connects Coleshill Hall Cottages and Coleshill Manor Office Campus in the south-west with the village of Gilson in the north-east;
  - B4117 Gilson Road, which provides a link between the A446 Lichfield road in

the south-east and the B<sub>4117</sub> Watton Lane; and

- Attleboro Lane, which provides a footpath under the M6 and A<sub>452</sub> from Water Orton to Kingshurst in Solihull.

### *Baseline conditions*

- 5.21.15 The baseline traffic flow conditions have been identified using the survey flows, these have been summarised for the study area in Table 5-136.

Table 5-136: Coleshill Junction 2012 baseline flows (vehicles)

Location	Direction	2012 baseline AM peak (08:00-09:00)		2012 baseline PM peak (17:00-18:00)	
		All vehicles	HGV	All vehicles	HGV
A <sub>446</sub> Lichfield Road, between south of its junction with the M6 and north of its junction with the B <sub>4117</sub>	NB	701	91	1,185	66
	SB	1,282	90	775	49
B <sub>4114</sub> Birmingham Road, between east of River Cole and its junction with the A <sub>446</sub>	WB	674	47	712	36
	EB	566	43	672	33
B <sub>4117</sub> Gilson Road, between its junction with Gilson Drive and its junction with the A <sub>446</sub>	WB	157	6	365	12
	EB	277	10	139	2

- 5.21.16 A total of seven junctions have been identified as having potential to be significantly affected by the Proposed Scheme, these include:
- Coleshill Heath Road/Yorkminster Drive;
  - B<sub>4118</sub> Birmingham Road/B<sub>4118</sub> Marsh Lane/B<sub>4117</sub> Birmingham Road;
  - M6/ A<sub>446</sub> Stonebridge Road;
  - A<sub>446</sub> Lichfield Road/B<sub>4117</sub> Watton Lane;
  - A<sub>446</sub> Lichfield Road/B<sub>4117</sub> Gilson Road;
  - Birmingham Road/B<sub>4114</sub> Birmingham Road/A<sub>446</sub> Stonebridge Road; and
  - A<sub>446</sub> Stonebridge Road/Coleshill Heath Road.

- 5.21.17 The following tables summarise the 2012 baseline performance of those junctions outlined above that operate over capacity, in the AM and/or PM peak hours.

Table 5-137: 2012 baseline performance at the B4118 Birmingham Road/B4118 Marsh Lane/B4117 Birmingham Road junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
B4118 Birmingham Road (West)	327	31%	0	439	104%	9
B4118 Marsh Lane	308	44%	1	432	103%	16
B4117 Birmingham Road (East)	191	19%	0	439	49%	1

Table 5-138: 2012 baseline performance at the Birmingham Road/B4114 Birmingham Road/A446 Stonebridge Road junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
A446 Stonebridge Road (North)	1,369	92%	10	1,142	75%	3
B4114 Birmingham Road (East)	674	198%	205	536	111%	36
A446 Stonebridge Road (South)	1,080	68%	2	995	63%	2
B4114 Birmingham Road (West)	692	116%	58	770	130%	102

5.21.18 The tables above show that one junction (Birmingham Road/B4114 Birmingham Road/A446 Stonebridge Road) operates over capacity in both the AM and PM peak hours. With the B4118 Birmingham Road/B4118 Marsh Lane/B4117 Birmingham Road junction operating over capacity in the PM peak hour.

5.21.19 Although currently operating with spare capacity, the following tables represent junctions that are approaching a flow/capacity ratio of 85% on at least one junction arm within the AM or PM peak.

Table 5-139: Coleshill Junction area 2012 baseline performance at the M6/A446 Stonebridge Road junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
A446 Stonebridge Road (north)	1,138	73%	3	1,024	63%	2
M6 east	612	61%	2	389	32%	0
A446 Stonebridge Road (south)	495	27%	0	715	38%	1
M6 west	943	63%	2	793	55%	1

Table 5-140: 2012 baseline performance at the A446 Lichfield Road/B4117 Watton Road junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
A446 Lichfield Road (north)	1,087	35%	4	752	28%	3
A446 Lichfield Road (south)	816	55%	9	1,131	77%	18
B5517 Watton Lane	189	61%	5	143	46%	4

Table 5-141: 2012 baseline performance at the A446 Lichfield Road/B4117 Gilson Road junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
A446 Lichfield Road	1,033	62%	2	864	48%	1
B4117 Lichfield Road	224	78%	3	277	67%	2
A446 Stonebridge Road	885	46%	1	1,048	53%	1
B4117 Gilson Road	257	62%	2	134	31%	0

Table 5-142: 2012 baseline performance at the A446 Stonebridge Road/Coleshill Heath Road junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
A446 Stonebridge Road (Southbound)	1,525	73%	3	1,094	49%	1
A446 Stonebridge Road (Northbound)	1,240	43%	1	1,370	43%	1
Coleshill Heath Road	475	59%	1	492	59%	1

## Accidents and safety

- 5.21.20 Relevant accident data for the road network subject to assessment has been obtained from WCC for all accidents that occurred between June 2009 and June 2012.
- 5.21.21 Within this area, a total of 39 accidents occurred over the three year period, of which 30 (76%) were recorded as slight, 8 (21%) as serious and one (3%) as fatal. The table below shows the accidents by year and severity.

Table 5-143: Severity of accidents by year within the Coleshill Junction area

Year	Slight	Serious	Fatal	Total
2009	4	0	0	4
2010	9	4	1	14
2011	10	2	0	12
2012	7	2	0	9
Total	30	8	1	39

- 5.21.22 Within this area, no locations have been identified where there are substantial clusters of accidents.

## Public transport

### *Rail network*

- 5.21.23 The Proposed Scheme will cross the existing Birmingham to Leicester rail services currently, operated by CrossCountry, between Water Orton and Coleshill Parkway. This service runs with an average off-peak frequency of two services per hour and a total of 35 services per day.

### *Local bus services*

- 5.21.24 There are seven public bus services; route numbers 90, 97, 777, 891, 115, 223 and 757; that pass through the Coleshill Junction area. The bus services provide connections to Birmingham, Water Orton, Coleshill, Solihull, Tamworth, Kingsbury, Curdworth and Sutton Coldfield. These services provide a maximum combined service frequency of 16 buses per hour between Monday and Friday.
- 5.21.25 The following table shows the bus route numbers, their service frequency as well as the road on which the Proposed Scheme will intersect with the bus services.

Table 5-144: Bus Services Frequencies in CFA19

Bus Route Number (s)	Frequency of Service	Road Name
90	35 daily services (Monday – Friday), 32 (Sat), 14 (Sun)	Coleshill Heath Road, A446 Lichfield Road
97	approximately 8 services/hr (Monday – Saturday), approximately 3 services/hr (Sunday)	Coleshill Heath Road
777	24 daily services (Mon-Friday), 20 (Saturday)	Coleshill Heath Road
891	2 daily services (Monday – Friday)	Coleshill Heath Road
115	13 daily services (Monday – Friday), 12 (Saturday)	A446 Lichfield Road
223	1 service on Mondays	A446 Lichfield Road, B4117 Gilson Road

Bus Route Number (s)	Frequency of Service	Road Name
757	4-5 daily services (Monday – Saturday)	A446 Lichfield Road

### Pedestrians, Cyclists and Equestrians

- 5.21.26 A total of seven PRow will cross the route of the Proposed Scheme within the Coleshill Junction area. The usages of these have been identified and five of the routes were used by less than 10 people a day. The routes with the greatest usage are shown in the following table.

Table 5-145: PRow locations and references (CFA19)

Description of location	PRow Reference	Usage per day
Attleboro Farm	M43	28
Link from Ryeclose Croft under the M6 (Green Lane Track)	M77	20

- 5.21.27 Results for all PRow surveys can be found in Annex B(iv).

### Waterways/canals

- 5.21.28 There are no navigable waterways in the area.

### Air transport

- 5.21.29 No airports have been identified within the study area. However Birmingham International Airport is located approximately 8km from Coleshill, in the neighbouring CFA (CFA24).



## 5.22 Curdworth to Middleton (CFA20)

### Study area

- 5.22.2 This section provides an overview of the baseline traffic and transport conditions for the section of Proposed Scheme that passes through the Curdworth to Middleton area.
- 5.22.3 It describes the transport infrastructure within the area, which will be affected either by the construction or by the operation of the Proposed Scheme. The location of the key transport infrastructure is outlined in Figure 2, Volume 2 (CFA20 Report).
- 5.22.4 The scope of work and study area has been discussed with the key transport authorities including WCC and the HA.
- 5.22.5 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from south to north along the proposed route.

### Local land uses

- 5.22.6 The Curdworth to Middleton area is broadly divided by the M42 into two distinct sections. The north-eastern section is predominantly rural, with the majority of land used for crop cultivation and a number of villages and small towns dispersed through the region. The southwestern section of the area is mainly urban including the outskirts of Birmingham and other towns such as Sutton Coldfield.

### Surveys

- 5.22.7 Traffic, non-motorised user and waterway surveys were undertaken between June and July 2012, with additional surveys undertaken in May and June 2013 and the survey locations are shown in Annex B(iv), together with the summarised survey data.

### Traffic surveys

- 5.22.8 Traffic flow data have been collected through the following types of surveys:
- MCC - surveys at highway junctions, to identify the existing traffic demand and turning profiles at the key junctions, located within the study area;
  - ATC - surveys to establish the existing link traffic volumes along the highway routes forming the study area; and
  - queue length surveys – to coincide with the junction surveys such that this data could be used in combination with the demand information to assist model calibration as necessary.

- 5.22.9 The traffic survey data have been further supplemented by transport data obtained from other sources where available, including from the HA and survey information held by the local authorities.
- 5.22.10 The traffic data showed that for the study area the weekday AM peak hour is 08:00-09:00 and the PM peak hour is 17:00-18:00.

#### *Non-motorised user surveys*

- 5.22.11 Non-motorised user surveys were undertaken in August and September 2012, with additional surveys undertaken in May and June 2013, to establish the usage of PRow including roads, in the area of the Proposed Scheme. As appropriate to their role, these surveys covered weekday and weekend use. The surveys included:
- all roads and associated footways intersected by the Proposed Scheme; and
  - green corridors including footpaths, cycleways, bridleways, river and canal paths.

#### *Waterway surveys*

- 5.22.12 Surveys of waterways have been undertaken in July 2013 in order to establish the usage of boats on navigable canals in the study area.
- 5.22.13 Within the Curdworth to Middleton area there is one navigable waterway located, Birmingham and Fazeley Canal.

### **Highway network**

#### *Strategic road network*

#### **Motorway network**

- 5.22.14 There are two motorways that pass through the area. These are as follows:
- the M6 Toll, which travels in a broadly south/north-west direction and is accessed in the area from the M42/A446 Lichfield Road/Kingsbury Road roundabout in the south and via the A38 further north; and
  - the M42, which has a broadly south/north-east alignment and is accessed in this area from the M6 Toll/A446 Lichfield Road/Kingsbury Road roundabout.

#### **Primary 'A' roads**

- 5.22.15 The A446 Lichfield Road runs broadly in a south/north-western alignment through the area.

#### **Non-Primary 'A' roads**

- 5.22.16 The following single carriageway 'A' roads pass through the study area:
- A4097 Kingsbury Road, which starts at the A446 Lichfield Road/M42/A4097 Kingsbury Road roundabout in the south-west to the A4097 Kingsbury

Road/A51/B4098 Coventry Road roundabout in the north-east outside of Kingsbury; and

- A4091, which runs broadly in a south/north direction and starts at the A446 Lichfield Road/M6Toll/A4091 roundabout and ends in this area just outside of Middleton.

### *Local road network*

5.22.17 The main local roads affected by the Proposed Scheme, from south to north, are as follows:

- Faraday Avenue, which runs from the A446 Lichfield Road/Marsh Lane/Faraday Avenue roundabout in the west to the Faraday Avenue/Fishery Lane roundabout in the east through Coleshill's National Distribution Park;
- Bodymoor Heath Road, which has a broadly south-east/north-western alignment;
- Park Lane, which connects Wishaw Lane in the west with the A4091 in the east; and
- Church Lane, which runs through the village of Middleton in a west/east alignment.

### *Baseline conditions*

5.22.18 The baseline traffic flow conditions have been identified using the survey flows, these have been summarised for the study area in Table 5-146.

Table 5-146: Curdworth to Middleton local road network 2012 baseline traffic flows (vehicles)

Location	Direction	2012 baseline AM peak (08:00-09:00)		2012 baseline PM peak (17:00-18:00)	
		All vehicles	HGV	All vehicles	HGV
A446 South of Faraday Avenue	NB	898	135	1,116	103
	SB	1,257	70	784	42
Faraday Avenue, between A446 and Edison Road	WB	664	130	475	116
	EB	289	116	754	86
A4097 Kingsbury Road, between M42 and the Reindeer Park Lodge access road	EB	809	80	382	41
	WB	323	62	831	49
A4091 Tamworth Road, between the A446 and Church Lane	NB	284	31	633	32
	SB	599	43	428	25
Church Lane, between Walker's Spinney and A4091	WB	42	3	36	1
	SB	30	4	46	1

Location	Direction	2012 baseline AM peak (08:00-09:00)		2012 baseline PM peak (17:00-18:00)	
		All vehicles	HGV	All vehicles	HGV
A446 North of A4091	EB	906	120	1,113	76
	WB	990	133	767	61

5.22.19 A total of four junctions have been identified as having potential to be significantly affected by the Proposed Scheme, these include:

- A446 Lichfield Road/Faraday Avenue/Marsh Lane;
- A446 Lichfield Road/A4097 Kingsbury Road/M42;
- A4091/Park Lane; and
- A4091/A446 Lichfield Road.

5.22.20 The following tables summarise the 2012 baseline performance of those junctions outlined above that operate close to or over capacity, in the AM and/or PM peak hours.

Table 5-147: 2012 baseline performance at the A446 Lichfield Road/A4097 Kingsbury Road/M42 junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
M42 (N)	481	44%	8	293	27%	4
A4097 (Kingsbury Road)(E)	643	58%	10	350	32%	5
A446 (Lichfield Road)(S)	752	82%	14	1,343	88%	24
M42 (S)	1,246	71%	20	2,011	87%	35
A4097 (Kingsbury Road)(W)	674	73%	12	684	74%	12
A446 (Lichfield Road)(N)	1,339	75%	21	771	74%	13

Table 5-148: 2012 baseline performance at the A4091 Tamworth Road/A446 Lichfield Road junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
A4091	581	50%	1	291	21%	0
A446 Lichfield Road South (NB)	1,158	62%	2	2,226	117%	130
M6 Toll	123	10%	0	44	5%	0
A446 Lichfield Road North (SB)	1,127	73%	3	829	54%	1

- 5.22.21 Table 5-147 above shows the A446 Lichfield Road/A4097 Kingsbury Road/M42 junction operating close to capacity on several arms in both the AM and PM peak hours, with the A4091 Tamworth Road/A446 Lichfield Road junction (Table 5-148) operating over capacity on the northbound A446 Lichfield Road (south) arm in the PM peak hour only.

### Accidents and safety

- 5.22.22 Relevant accident data for the road network subject to assessment has been obtained from WCC for all accidents that occurred between June 2009 and June 2012.
- 5.22.23 Within the Curdworth to Middleton area, a total of 50 accidents occurred over the three year period, of which 40 (80%) were recorded as slight and 10 (20%) as serious. The table below shows the accidents by year and severity. It should be noted that no fatal accidents were recorded over the three year period.

Table 5-149: Severity of accidents by year within the Curdworth to Middleton area

Year	Slight	Serious	Total
2009	12	4	16
2010	12	4	16
2011	9	2	11
2012	7	0	7
Total	40	10	50

- 5.22.24 Analysis of the data has shown that two junctions within the area experienced a substantial amount of accidents during the three year period. These junctions are:
- A446 Lichfield Road/Faraday Avenue junction in Coleshill with ten accidents; and
  - Dunton Roundabout, where the M42 slip roads (Junction 9) meets the A446 Lichfield Road and A4097 Kingsbury Road with 14 accidents over the three

year period.

## Public transport

### *Rail network*

- 5.22.25 The Proposed Scheme will cross the existing Birmingham to Derby rail line, with services operated by CrossCountry, between Water Orton and Wilnecote. This service runs via Tamworth with an average off-peak frequency of two to three services per hour and a total of approximately 42 services per day in each direction.

### *Local bus services*

- 5.22.26 There are five public bus services, route numbers 90, 115, 223, 116, 216, which pass through the Curdworth to Middleton area. The bus services provide connections to Birmingham, Solihull, Tamworth, Kingsbury, Curdworth, Coleshill and Middleton. These services provide a maximum combined service frequency of six buses per hour between Monday and Friday.
- 5.22.27 The following table shows the bus route numbers, their service frequency as well as the road on which the Proposed Scheme will intersect with the bus services.

Table 5-150: Bus services frequencies in CFA20

Bus route number (s)	Frequency of service	Road name
90	35 daily services (Monday – Friday), 32 (Saturday), 14 (Sunday)	Faraday Avenue
115	13 daily services (Monday – Friday), 12 (Saturday)	Faraday Avenue, A4097 Kingsbury Road
223	1 service on Mondays	Faraday Avenue
116	12 daily services (Monday – Friday), 11-12 (Saturday)	A4097 Kingsbury Road
216	1 service on Thursdays	Bodmoor Heath Road

## Pedestrians, cyclists and equestrians

- 5.22.28 A total of ten PRoW will cross the route of the Proposed Scheme within the Curdworth and Middleton area. The usages of these have been identified and six of the routes were used by less than 10 people a day. The routes with the greatest usage are shown in the following table.

Table 5-151: PRoW locations and references (CFA20)

Description of location	PRoW reference	Usage per day
Link from Church Lane to Drayton Lane, Middleton	T15	25
Marston Lane, Coleshill	M450	15

5.22.29 Results for all PRow surveys can be found in Annex B(iv).

### **Waterways/canals**

5.22.30 There is one navigable waterway situated within the Curdworth to Middleton area, the Birmingham and Fazeley Canal. The usage of two boats per day has been identified following surveys.

### **Air transport**

5.22.31 No airports have been identified within the study area.



## 5.23 Drayton Bassett, Hints and Weeford (CFA21)

### Study area

- 5.23.2 This section provides an overview of the baseline traffic and transport conditions for the section of the Proposed Scheme that passes through the Drayton Bassett, Hints and Weeford area.
- 5.23.3 It describes the transport infrastructure within the area, which will be affected either by the construction or by the operation of the Proposed Scheme. The scope of work and study area has been discussed with the key transport authorities including SCC and the HA.
- 5.23.4 The study area includes roads potentially affected by the scheme including Shirrall Drive, Drayton Lane, the A453 Sutton Road, Bangley Lane (known locally as Waggoner's Lane), Brockhurst Lane (known locally as Rookery Lane), the A5, Watling Street, Flats Lane and the A51 Tamworth Road. The location of the key transport infrastructure can be found in Figure 2, Volume 2 (CFA21 Report).
- 5.23.5 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from south to north along the proposed route.

### Local land uses

- 5.23.6 The Drayton Bassett, Hints and Weeford area is predominantly rural, comprising largely of fields, small towns and villages. There are three main A roads (A51, A453 and A5) in this area and numerous country lanes.

### Surveys

- 5.23.7 Transport surveys have been undertaken to obtain baseline data for the impact assessment. Traffic, non-motorised user and waterway surveys were undertaken between June and July 2012, with additional surveys undertaken in May and June 2013 and the survey locations are shown in Annex B(iv), together with the summarised survey data.

### *Traffic surveys*

- 5.23.8 Traffic flow data have been collected through the following types of surveys:
- MCC - surveys at highway junctions, to identify the existing traffic demand and turning profiles at the key junctions, located within the study area;
  - ATC - surveys to establish the existing link traffic volumes along the highway routes forming the study area; and
  - queue length surveys – to coincide with the junction surveys such that this data could be used in combination with the demand information to assist model calibration as necessary.

- 5.23.9 The traffic survey data have been further supplemented by transport data obtained from other sources where available, including from the HA and survey information held by the local authorities.
- 5.23.10 The traffic data showed that for the study area the weekday AM peak hour is 08:00-09:00 and the PM peak hour is 17:00-18:00.

#### *Non-motorised user surveys*

- 5.23.11 Non-motorised user surveys were undertaken in August and September 2012, with additional surveys undertaken in May and June 2013, to establish the usage of PRow including roads, in the area of the route of the Proposed Scheme. As appropriate to their role, these surveys covered weekday and weekend use. The surveys included:
- all roads and associated footways intersected by the Proposed Scheme; and
  - green corridors including footpaths, cycleways, river and canal paths.

#### **Highway network**

##### *Strategic road network*

- 5.23.12 There are several strategic routes that pass through the area. These are as follows:
- the A5 travels in a broadly west/east direction and is accessed in the area from the A5/A38/M6 Toll slip roads roundabout and Watling Street; and
  - the A38 runs in a north/south alignment through the western fringe of the area and is accessed from the A38/A446/A453 Sutton Road roundabout, the A5/A38/M6 Toll slip roads roundabout and the A38/A5148/A5206 roundabout.

#### **Motorway network**

- 5.23.13 There is one motorway situated in the area. The M6 Toll lies on the western boundary of this CFA.

#### **Primary 'A' roads**

- 5.23.14 The following two 'A' roads will intersect with the alignment of the Proposed Scheme:
- the A453 Sutton Road, which runs between the A38/A446/A453 Sutton Road roundabout in the south-west and Mile Oak in the north-east; and
  - the A51 Tamworth Road, which connects Hopwas in the south and Lichfield in the north.

#### *Local road network*

- 5.23.15 The main local roads affected by the Proposed Scheme are as follows:
- Shirrall Drive, which connects the A453 Sutton Road in the west with Drayton

Lane in the east;

- Drayton Lane, which provides access to the village of Drayton Bassett;
- Bangle Lane, which runs broadly parallel to the A453 Sutton Road and connects a number of farms;
- Brockhurst Lane, which runs broadly parallel in the north to Bangle Lane;
- Watling Street, which runs in this area between the A5/A38/M6 Toll slip roads roundabout and Mile Oak; and
- Flats Lane, which connects Watling Street in the south with Whittington Barracks in the north.

### *Baseline conditions*

5.23.16 The baseline traffic flow conditions have been identified using the survey flows, these have been summarised for the study area in Table 5-152.

Table 5-152: Drayton Bassett, Hints and Weeford 2012 baseline traffic flows (vehicles)

Location	Direction	2012 baseline AM peak (08:00-09:00)		2012 baseline PM peak (17:00-18:00)	
		All vehicles	HGV	All vehicles	HGV
Strategic road network					
A38, Between A38/M6 Toll junction and A453	WB	1,035	123	1,735	138
	EB	1,823	207	1,154	97
A5 Between A38/M6 Toll junction and A453.	WB	1,055	15%	1,238	8%
	EB	1,210	15%	1,042	11%
Local road network					
A453 between A38/A446 junction and A5	NB	708	42	882	35
	SB	779	62	823	33
A453 between A5 and Watling Street/Jints Road junction	NB	951	29	1,070	21
	SB	822	33	1,016	10

5.23.17 A total of six junctions have been identified as having potential to be affected by the Proposed Scheme. These six junctions are as follows:

- A453 Sutton Road/Drayton Lane;
- A38 London Road/Watling Street/A5/M6 Toll slip roads;
- A38 London Road/A453 Tamworth Road/A446 London Road;
- A38 London Road/A5148/A5206;
- A5/A5127 Birmingham Road/A5148 (northern roundabout); and

- A5/A5127 Birmingham Road/A5148 (southern roundabout).

5.23.18

The following tables summarise the 2012 baseline performance of those junctions outlined above that operate close to or over capacity, in the AM and/or PM peak hours.

Table 5-153: 2012 baseline performance at the A38 London Road/Watling Street/A5/M6 Toll slip roads

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
A38 (N)	1,823	14%	0	1,154	25%	0
A453 (NE)	685	87%	14	553	70%	10
A446	577	74%	10	893	88%	23
A38 (S)	576	74%	11	1,277	86%	15
A453 (SW)	627	54%	14	779	84%	20

Table 5-154: 2012 baseline performance at the A38 London Road/A5148/A5206 junction

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
A5148 north	1,679	116%	126	1,349	86%	6
A38 London Road east	1,753	84%	5	2,450	119%	215
A5148 south	94	11%	0	98	14%	0
A5206 west	676	63%	2	383	36%	1

Table 5-155: 2012 baseline performance at the A5/A5127 Birmingham Road/A5148 (northern roundabout)

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
A5127 Birmingham Road (N)	632	80%	4	596	59%	1
A5148 (exit only)	-	-	-	-	-	-
A5127 Birmingham Road (S)	2,163	94%	13	2,348	102%	52
A5	1,792	83%	5	1,396	62%	2

## Accidents and safety

- 5.23.19 Traffic data have been obtained from SCC for all accidents that occurred within 500m of the Proposed Scheme. Data analysed in this report expands for three years, from 1st April 2009 to 31st March 2012.
- 5.23.20 Within this area, a total 14 accidents occurred over the three year period, all of which were recorded as slight. There are no locations where there are accident clusters and where additional traffic is likely to cause particular concern.

## Public Transport

### *Rail network*

- 5.23.21 Within this area there are no existing national or local rail services available.

### *Local bus services*

- 5.23.22 There is one public bus service, route number 110, which passes through the Drayton Bassett, Hints and Weeford area. The bus service provides connections to Birmingham, Sutton Coldfield, Mile Oak and Tamworth. This service provides a maximum service frequency of four buses per hour between Monday and Friday.
- 5.23.23 The Proposed Scheme will intersect with the bus route 110 on the A453 Sutton Road in the Drayton Bassett, Hints and Weeford area. Communities potentially affected include Sutton Coldfield and Bangle.

## Pedestrians, cyclists and equestrians

- 5.23.24 There are several pedestrian footways in this area, mainly in the areas surrounding Hints, Weeford and Drayton Bassett. A total of 14 PRow will cross the route of the Proposed Scheme within the Drayton Bassett, Hints and Weeford area. The usage of these has been identified and seven of the routes were utilised by fewer than ten people a day. The routes with the greatest usage are shown in the table below.

Table 5-156: PRow locations and references (CFA21)

Description of location	PRow Reference	Usage per day
Link from Jerry's Lane (northbound)	Swinfen and Packington 8	72
Footbridge over A5	Hints 4	47
Shirrall Drive	Drayton Bassett 10	21
Link from Rookery Lane (northbound)	Hints 11	19
Link from Rook Hill	Hints 0.378 and 19	17

- 5.23.25 Results for all PRow surveys can be found in Annex B(iv).

### **Waterways/canals**

- 5.23.26 There are no navigable waterways affected by the Proposed Scheme in this area and consequently these are not considered further in this assessment.

### **Air transport**

- 5.23.27 No airports have been identified within the study area.

## 5.24 Whittington to Handsacre (CFA22)

### Study area

- 5.24.1 This section provides an overview of the baseline traffic and transport conditions for the section of the Proposed Scheme that passes through the Whittington to Handsacre area.
- 5.24.2 It describes the transport infrastructure within the area, which will be affected either by the construction or by the operation of the Proposed Scheme. The scope of work and study area has been discussed with the key transport authorities including SCC and the HA.
- 5.24.3 The study area includes roads potentially affected by the scheme including the A38, A515 Lichfield Road, Lichfield Road (Whittington), Darnford Lane, Cappers Lane, Broad Lane, Wood End Lane, Netherstowe Lane and Shaw Lane. Trent and Mersey Canal, which is navigable, runs in a broadly north-west to south-east direction up to the point where it will cross the Proposed Scheme and then the canal will run in a south-west to north-east direction, although it is mainly used for recreational use. The location of the key transport infrastructure can be found in Figure 2, Volume 2 (CFA22 Report).
- 5.24.4 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from south to north along the proposed route.

### Local land uses

- 5.24.5 The Whittington and Handsacre area is partial rural and partial urban. The urban area comprises the city of Lichfield and surrounding smaller towns and villages. The remainder of the area is predominantly rural in nature.

### Surveys

- 5.24.6 Transport surveys have been undertaken to obtain baseline data for the impact assessment. Traffic, non-motorised user and waterway surveys were undertaken between June and July 2012, with additional surveys undertaken in May and June 2013 and the survey locations are shown in Annex B(iv), together with the summarised survey data.

### Traffic surveys

- 5.24.7 Traffic flow data have been collected through the following types of surveys:
- MCC - surveys at highway junctions, to identify the existing traffic demand and turning profiles at the key junctions, located within the study area;
  - ATC - surveys to establish the existing link traffic volumes along the highway routes forming the study area; and



- queue length surveys – to coincide with the junction surveys such that this data could be used in combination with the demand information to assist model calibration as necessary.

- 5.24.8 The traffic survey data have been further supplemented by transport data obtained from other sources where available, including from the HA and survey information held by the local authorities.
- 5.24.9 The traffic data showed that for the study area the weekday AM peak hour is 08:00 to 09:00 and the PM peak hour is 17:00 to 18:00.

### *Non-motorised user surveys*

- 5.24.10 Non-motorised user surveys were undertaken in August and September 2012, with additional surveys undertaken in May and June 2013, to establish the usage of PRow including roads, in the area of the route of the Proposed Scheme. As appropriate to their role, these surveys covered weekday and weekend use. The surveys included:
- all roads and associated footways intersected by the Proposed Scheme; and
  - green corridors including footpaths, cycleways, river and canal paths.

### *Waterway surveys*

- 5.24.11 Surveys of waterways have been undertaken in July 2013 in order to establish the usage of boats on navigable canals in the study area.

## **Highway network**

### *Strategic road network*

- 5.24.12 There is one strategic road which runs through the study area. The A38 runs in a south-west/north-east direction and connects in this area Lichfield with Alrewas.
- 5.24.13 There are no motorways that pass through the area.

### **Primary 'A' roads**

- 5.24.14 There is one primary 'A' road situated within this area which will be affected by the Proposed Scheme. The A515 Lichfield Road has a broadly south-west/north-east alignment and links the A51 Stafford Road with King's Bromley in this area.

### **Local road network**

- 5.24.15 The main local roads affected by the Proposed Scheme in this area are as follows:
- Lichfield Road (Whittington), which runs in a broadly west/east direction and connects the A51 Tamworth Road with Church Street just to the west of Whittington;

- Darnford Lane, which has a west/east alignment and connects Lichfield with Whittington;
- Cappers Lane, which runs in a broadly north-west/south-east direction and connects the east of Lichfield with Church Street just outside of Whittington;
- Broad Lane, which has a west/east alignment and links Cappers Lane to the west of Huddlesford with Burton Road in the north of Whittington;
- Netherstow Lane; which connects the A4192 in Lichfield with Curborough and Wood End Lane in the east;
- Wood End Lane, which runs in a west/east alignment and connects the A515 Lichfield Road with the A38 to the west of Fradley Business Park; and
- Shaw Lane, which lies to the south-east of Handsacre and travels in a south-west/north-east direction while linking the B5014 Lichfield Road with the A515 Lichfield Road.

### Baseline conditions

5.24.16 The baseline traffic flow conditions have been identified using the survey flows, these have been summarised for the study area in Table 5-157.

Table 5-157: Whittington to Handsacre 2012 baseline traffic flows (vehicles)

Location	Direction	2012 baseline AM peak (08:00-09:00)		2012 baseline PM peak (17:00-18:00)	
		All vehicles	HGV	All vehicles	HGV
Strategic road network					
A38, between junction with A5206 and junction with A5192	NB	1,930	309	2,076	228
	SB	2,017	343	2,086	209
A38, between junction with the A5192 and its junction with Wood End Lane	NB	1,739	296	1,904	228
	SB	1,599	288	1,789	197
Local road network					
A5192 Cappers Lane, between junction with the A5127 and its junction with the A38	NB	716	50	757	38
	SB	743	52	662	20
A5127 Burton Road, between junction with the A5192 and junction with the A38	EB	495	40	577	23
	WB	563	51	458	18
Wood End Lane, between junction with the A515 and junction with the A38	EB	283	17	126	19
	WB	154	28	315	13
A515 Lichfield Road, between junction with the A51 and approximately 600m to the east of junction with Wood End Lane	NB	199	28	270	16
	SB	309	22	220	22

- 5.24.17 A total of 11 junctions have been identified as having potential to be affected by the Proposed Scheme. These 11 junctions are as follows:
- A51 Tamworth Road/Lichfield Road (Whittington);
  - A51 Tamworth Road/Link road leading to Darnford Lane;
  - A5192 Eastern Avenue/A5127 Trent Valley Road/Cappers Lane/Valley Lane;
  - A38 slip roads/Cappers Lane (west);
  - A38 slip roads/Cappers Lane (east);
  - A515 Lichfield Road/B5014 Lichfield Road;
  - A51 Stafford Road/A515 Lichfield Road;
  - A51 Stafford Road/A5192 Eastern Avenue;
  - A51 Birmingham Road/A5127 Birmingham Road/A461 Sainte Foy Avenue/The Friary;
  - A51 The Friary/Friary Avenue/Friary Road; and
  - A461 Falkland Road/A5127 Birmingham Road.

- 5.24.18 All the junctions outlined above operate with spare capacity in the AM and PM peaks in 2012 baseline, except the A5192 Eastern Avenue/A5127 Trent Valley Road/Cappers Lane/Valley Lane junction (Table 5-158) which operates close to capacity, in the AM and PM peak hours

Table 5-158: 2012 baseline performance at the A5192 Eastern Avenue/A5127 Trent Valley Road/Cappers Lane/Valley Lane

Approach (from)	2012 baseline – AM peak (08:00-09:00)			2012 baseline – PM peak (17:00-18:00)		
	Flow (all PCU)	Flow/capacity %	Max queue	Flow (all PCU)	Flow/capacity %	Max queue
A5192 Eastern Avenue	804	77%	3	750	68%	2
A5127 Trent Valley Road (East)	734	77%	3	785	80%	4
A5192 Cappers Lane	813	86%	6	784	86%	6
A5127 Trent Valley Road (West)	495	73%	3	527	87%	6
Valley Lane	153	38%	1	103	33%	1

## Accidents and safety

- 5.24.19 Traffic data have been obtained from SCC for all accidents that occurred within 500m of the Proposed Scheme. Data analysed in this report expands for three years, from 1st April 2009 to 31st March 2012.

5.24.20 Within this area, a total of 36 accidents occurred over the three year period, of which 33 (92%) were recorded as slight, two (5.5%) as serious and one (2.5%) as fatal.

5.24.21 Analyses of the data have shown no accident clusters although a total of 14 accidents occurred in the three year period on the A38, over a stretch of approximately 2.3km.

## **Public transport**

### *Rail network*

5.24.22 The Proposed Scheme will cross the existing Virgin Train services between:

- London Euston and Holyhead or Wrexham General;
- London Euston and Liverpool Lime Street;
- London Euston and Glasgow Central; and
- London Euston and Manchester Piccadilly.

5.24.23 The Proposed Scheme will intersect with these services between Lichfield Trent Valley and Tamworth. Virgin operates a minimum of seven rail services per hour to these destinations.

5.24.24 The proposed route will cross the existing Crewe to London Euston rail services, operated by London Midland, between Lichfield Trent Valley and Tamworth. This route runs with an average off peak frequency of one service per hour and a total of 17 services per day. The proposed route will also cross rail services between Lichfield Trent Valley and Burton-On-Trent. This route is a freight-only route and is only used by Cross-City Line (operated by London Midlands) as an alternative route when there is engineering disruption.

### *Local bus services*

5.24.25 There are four public bus services, route numbers 765, 785, 7 and X12, which pass through the Whittington to Handsacre area. The bus services provide connections to Lichfield, Whittington, Tamworth, Nuneaton, Burton upon Trent and Sutton Coldfield. These services provide a maximum combined service frequency of five buses per hour between Monday and Friday.

5.24.26 The following roads are bus routes, which will be affected by the Proposed Scheme:

- Whittington Common Road (bus route no. 756 and 785); and
- A38 (bus route no. 7 and X12).

5.24.27 The communities served by bus services, which will be affected by the Proposed Scheme include:

- bus number 765 and 785 - Whittington and Lichfield to Tamworth and

Nuneaton; and

- bus number 7 and X12 - Streethay, Fradley and Lichfield to Burton upon Trent and Sutton Coldfield.

### **Pedestrians, cyclists and equestrians**

5.24.28 There are pedestrian footways within the area, mainly surrounding the city of Lichfield.

5.24.29 A total of seven PRow will cross the route of the Proposed Scheme within the Whittington to Handsacre area. The usage of these has been identified and five of the PRow were used by less than ten people a day. The routes with the greatest usage are shown in the following table.

Table 5-159: PRow locations and usages (CFA22)

Description of location	PRow reference	Usage per day
Whittington Common Road	Whittington 16	26
Ash Tree Lane	Streethay 6	14

5.24.30 Results for all PRow surveys can be found in Annex B(iv).

### **Waterways/canals**

5.24.31 There is one navigable waterway situated within the Whittington to Handsacre area, Trent and Mersey Canal. The usage of five boats per day has been identified during a survey undertaken.

### **Air transport**

5.24.32 No airports have been identified within the study area.

## **5.25 Balsall Common and Hampton in Arden (CFA23)**

### **Study area**

- 5.25.2 This section provides an overview of the baseline traffic and transport conditions for the section of Proposed Scheme that passes through the Balsall Common and Hampton-in-Arden CFA.
- 5.25.3 It describes the transport infrastructure in the CFA which would be affected, either by the construction or operation of the Proposed Scheme. For this area, the baseline conditions relate to the transport network expected to be affected by construction of the proposed rail corridor and the Birmingham Interchange station, along with the operational impacts of the proposed railway and station.
- 5.25.4 The scope of work and study area has been discussed with the key transport authorities, including Solihull Metropolitan Borough Council (SMBC), Birmingham City Council (Birmingham CC), Coventry City Council (CCC), WCC, Centro (the West Midlands Integrated Transport Authority) and the HA.
- 5.25.5 The location of the key transport infrastructure can be found in Figure 2, Volume 2 (CFA23 Report) for the Balsall Common and Hampton-in-Arden CFA, including the A452 Kenilworth Road, the B4101 Balsall Street East/Kelsey Lane/Waste Lane and the B4102 Meriden Road/Hampton Lane and minor roads accessing villages and local communities.
- 5.25.6 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from south to north along the proposed route. In addition, some modes of transport have been broken down into areas, including:
- Balsall Common, which covers the village and immediate environs of Balsall Common, plus Berkswell Station;
  - Hampton-in Arden, which covers the village of Hampton-in-Arden and Hampton-in Arden Station; and
  - Meriden, which covers the village of Meriden.

### **Local land uses**

- 5.25.7 The proposed route alignment in the Balsall Common and Hampton-in-Arden CFA will pass through primarily agricultural land, with a network of villages and local communities including Balsall Common, Berkswell and Hampton-in-Arden.

## Surveys

- 5.25.8 Transport surveys have been undertaken to obtain baseline data for the impact assessment. Traffic, non-motorised user and station surveys were undertaken in June 2012 and June 2013 and the survey locations are shown in Annex B(v).

### *Traffic surveys*

- 5.25.9 The traffic surveys comprised of ATC on highway links across the study area. Wherever possible, ATC data was gathered for a continuous two week period.
- 5.25.10 The traffic survey data has been further supplemented by traffic data extracted from the HA TRADS database which collects continuous data at various locations around the network.
- 5.25.11 The traffic data showed that for the study area the weekday AM peak hour was 08:00- 09:00 and the PM peak hour was 17:00-18:00.

### *Non-motorised user surveys*

- 5.25.12 Non-motorised user surveys were undertaken in August and September 2012 to establish the usage of PRoW including roads, in the area of the Proposed Scheme. The surveys included:
- all roads and associated footways intersected by the proposed line of the route.
  - green corridors including footpaths, cycleways, bridleways, river and canal paths.
- 5.25.13 The August surveys were carried out between 08:00 and 18:00 on a weekend to capture leisure users. The September surveys were undertaken between 07:00 and 19:00 on a weekday to capture school and commuting users. September surveys were carried out on the routes that were identified as having a school or commuting use. Where possible, this was identified through discussions with the local highway authority.

### *Station surveys*

- 5.25.14 Surveys were carried out at Birmingham International Station, the key railway station in the area and are included and referenced in Birmingham Interchange and Chelmsley Wood CFA (CFA24). Unlike Birmingham International Station, only local trains stop at Berkswell Station and Hampton-in Arden Station, before continuing to/coming from Birmingham International Station.

## Highway network

- 5.25.15 The following section describes the roads that would be affected by the Proposed Scheme, either at the construction or operational stage.



### *Strategic road network*

- 5.25.16 The strategic road network is shown on Figure 5-64.

#### **Motorway network**

- 5.25.17 Although the M42 passes to the west of Hampton in Arden, there is no motorway connection in the immediate vicinity of the Proposed Scheme alignment where it passes through the Balsall Common and Hampton-in-Arden CFA. The M42 (junction 6) and M6 (junction 4) are included in the assessment for the Birmingham Interchange and Chelmsley Wood (CFA24).

#### **Primary 'A' roads**

- 5.25.18 The A452 Kenilworth Road connects Kenilworth with Sutton Coldfield, passing through Balsall Common. It is a single carriage way road from Kenilworth, with a 30mph speed limit through Balsall Common, before becoming a dual two lane carriageway road, with a 81kph (50mph) speed limit, north of Balsall Common (between Balsall Common and the Stonebridge Island at its junction with the A45 Coventry Road). A number of local roads join the A452 within the Balsall Common and Hampton-in-Arden CFA (and have junctions with the A452), but none of them are 'A' roads.
- 5.25.19 The A4177, which has a junction with the A452, is south of Balsall Common, near Meer End.

### *Local road network*

- 5.25.20 The local road network is shown on Figure 5-65.
- 5.25.21 The B4101, a single carriageway road, marks a southern edge to Balsall Common's built environment, at a 4-arm signalled junction with the A452. To the west, as Balsall Street East, it connects Balsall Common with Temple Balsall and Knowle, with frontage access in Balsall Common. To the east, as Kelsey Lane/Waste Lane, it links Balsall Common with Tile Cross and Coventry (including access to Nailcote Hall) and it also crosses the West Coast Main Line.
- 5.25.22 North of the B4101, there are commercial and residential frontages with accesses to the A452. Station Road is a single carriageway road, in the heart of Balsall Common's built environment. To the west it provides access to residential properties and a junction with the B4101. To the east it provides access to the village centre and Berkswell Station. The junction of Station Road and the A452 is a 4-arm roundabout junction, with off-road car parking in the village centre and access to Berkswell Station via Truggist Lane (but via a restricted road width, a height restriction and a 3-stage traffic signal controlled junction which incorporates access to the station).



Figure 5-64: Strategic road network

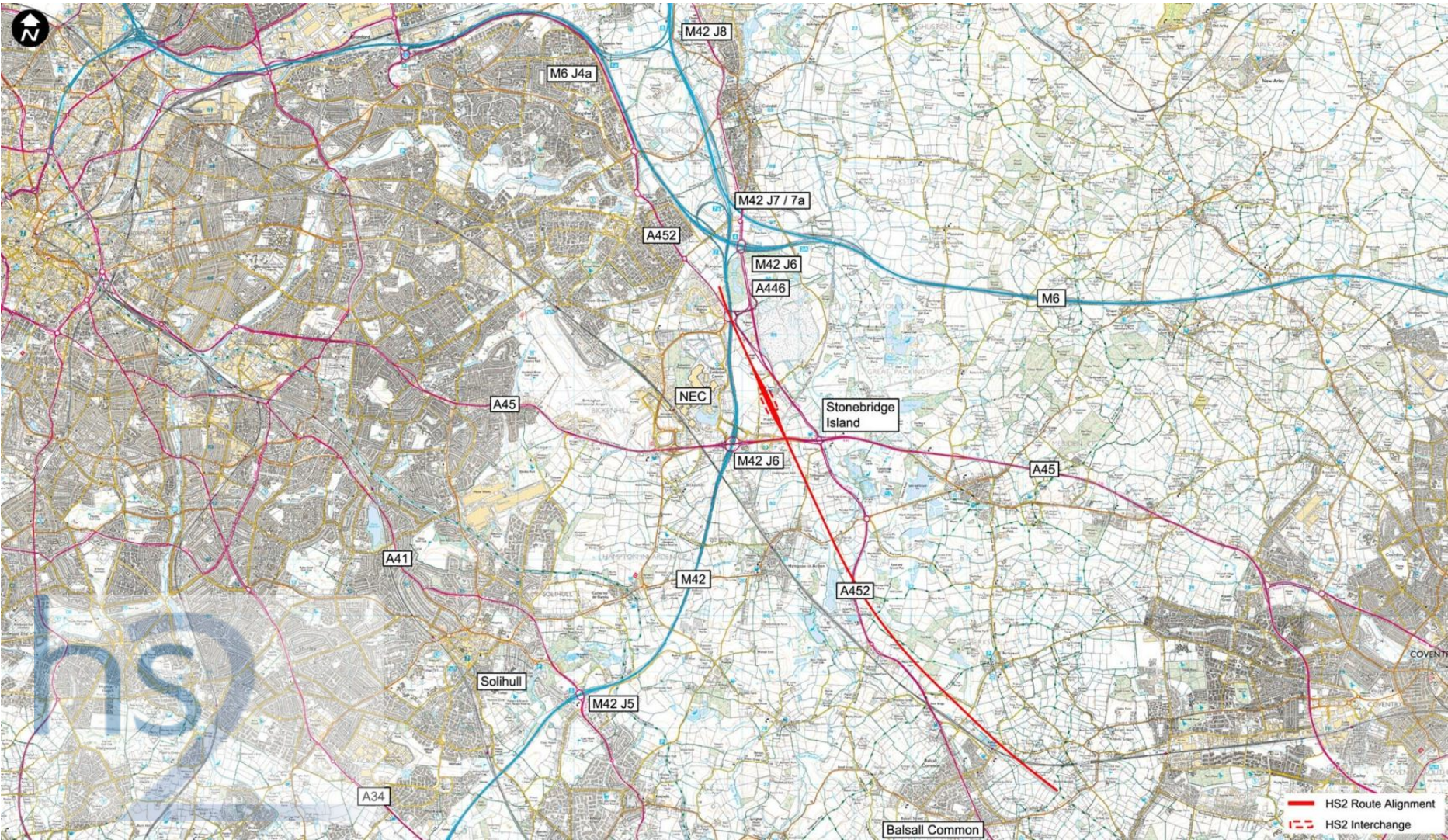
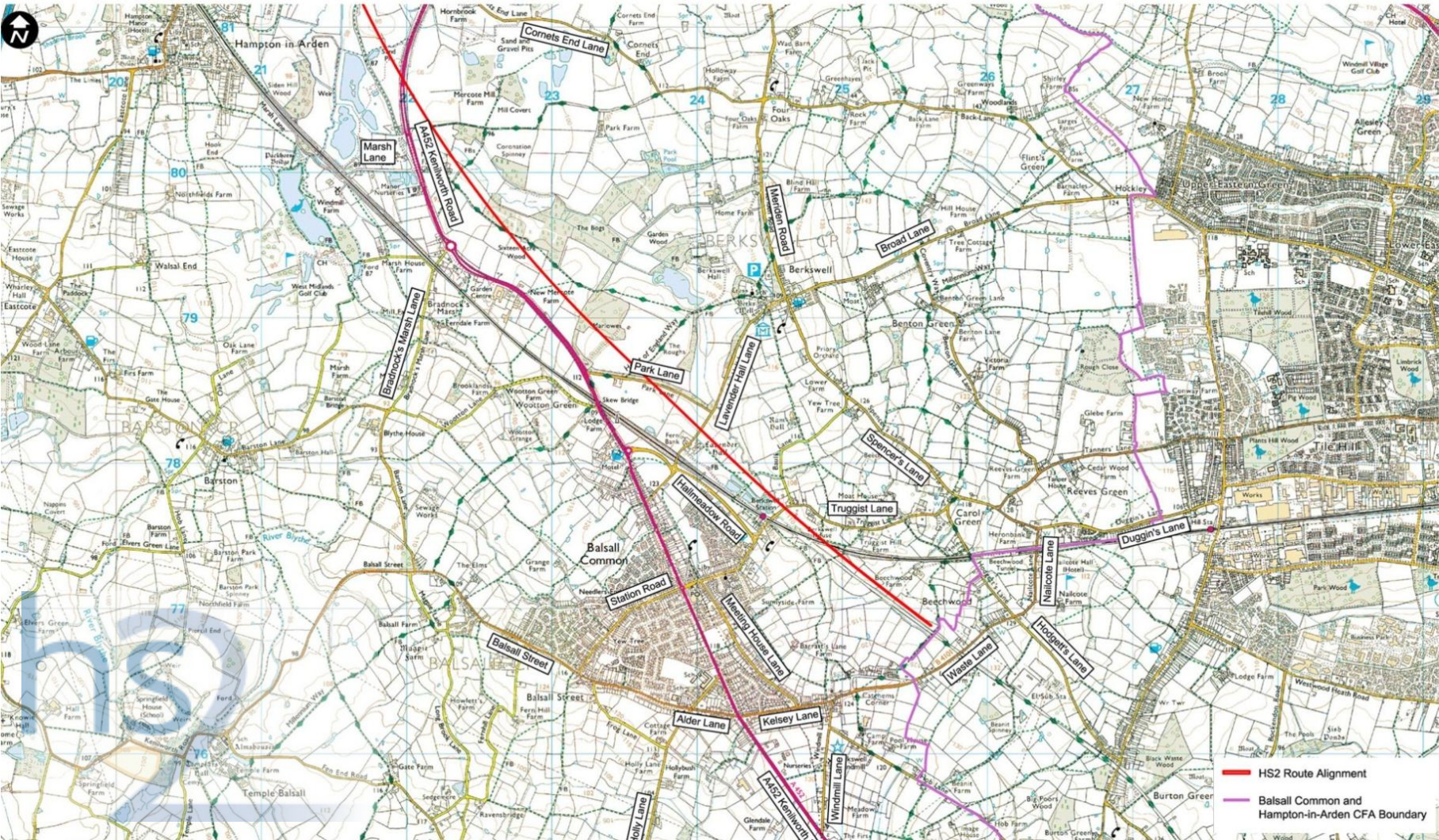




Figure 5-65: Local road network





- 5.25.23 North of Station Road, there are commercial and residential frontages with accesses to the A452. The junction of Dengate Drive/Chapel Drive with the A452 is a 4-arm roundabout junction, providing access to residential properties. Lavender Hall Road is a single carriageway road on the east side of the A452, at a priority junction, providing access to Lavender Hall Park (in Balsall Common) and the village of Berkswell.
- 5.25.24 Hallmeadow Road, a single carriageway road, marks a northern edge to Balsall Common's built environment, at a 3-arm roundabout junction with the A452. Hallmeadow Road is a single carriageway road with no frontage access. Hall Meadow Road has a north west to south east alignment and links back to junctions with Lavender Hall Road and Station Road.
- 5.25.25 Between Hallmeadow Road and the B4102, there are a number of roads with junctions on to the A452. Park Lane is the only road on the east side, with a priority junction at the A452. Park Lane is a single carriageway rural road, providing access to Berkswell. On the west side of the A452, Wootton Lane, Bradnock's Marsh Lane and Marsh Lane are single carriageway rural roads, with priority junctions, providing access to residential properties, local communities and West Midlands Golf Club, whilst Marsh Lane provides access to the Lincoln Farm Truck Stop and Café and the Marsh Lane Nature Reserve. There are also commercial and residential frontages with accesses on the west side of the A452.
- 5.25.26 The junction of the A452 and B4102 Meriden Road/Hampton Lane is a large 5-arm roundabout junction, which also includes Cornets End Lane. To the west, as Meriden Road, the B4102 is a single carriageway rural road to Hampton-in-Arden, Catherine-de-Barnes and Solihull, with a national speed limit until it reduces to 30mph entering Hampton-in-Arden. To the east, as Hampton Lane, the B4102 is a single carriageway rural road to Meriden, Fillongley and Nuneaton and also access to North Warwickshire Golf Club and Stonebridge Golf Club, with a 81kph (50mph) speed limit until it reduces to 30mph entering Meriden. Cornets End Lane is a single carriageway rural road providing access to local mineral workings for the extraction of sand and gravel.
- 5.25.27 Between the B4102 and A45 junctions, Diddington Lane is the only road with access on to the A452. Diddington Lane is a single carriageway rural road, with a priority junction providing access to local farms and residential properties and an access to Hampton-in-Arden. The River Blythe crosses the A452 between the B4102 and A45 junctions. The Stonebridge Island junction of the A452 and A45 is a grade separated junction.

### *Baseline conditions*

- 5.25.28 The assessment of the traffic flows in the Balsall Common and Hampton-in-Arden CFA shows that, typically, the peak are 08:00–09:00 in the AM and 17:00–18:00 in the PM.

5.25.29 The existing conditions for 2012 are shown below in Table 5-160 and Table 5-161. These are firstly shown in Table 5-160 for the key strategic routes through the area including the A452 Kenilworth Road. Secondly, in Table 5-161 the existing flows for the local road network are also shown.

Table 5-160: Balsall Common and Hampton-in-Arden 2012 baseline flows (strategic road network)

	Direction	AM Peak		PM Peak	
		Vehicles	HGVs	Vehicles	HGVs
A452 Kenilworth Road (between Wootton Lane and Hallmeadow Road)	NB	929	16	768	16
A452 Kenilworth Road (between Wootton Lane and Hallmeadow Road)	SB	742	13	946	20
A452 Kenilworth Road (between Windmill Lane and Meer End Road)	NB	785	14	813	17
A452 Kenilworth Road (between Windmill Lane and Meer End Road)	SB	750	13	765	16
A452 Kenilworth Road (between Meriden Lane and Marsh Lane)	NB	1005	18	813	17
A452 Kenilworth Road (between Meriden Lane and Marsh Lane)	SB	807	14	1,099	23
A452 Kenilworth Road (between Station Road and Gypsy Lane)	NB	808	14	798	17
A452 Kenilworth Road (between Station Road and Gypsy Lane)	SB	721	13	700	15
A452 Kenilworth Road (south of Stonebridge Roundabout)	NB	1,044	48	1,102	68
A452 Kenilworth Road (south of Stonebridge Roundabout)	SB	1,239	58	1,315	81
A452 Kenilworth Road (between Lavender Hall Lane and Station Road)	NB	877	16	734	16
A452 Kenilworth Road (between Lavender Hall Lane and Station Road)	SB	794	14	914	20
A452 Kenilworth Road (between Wootton Green Lane and Lavender Hall Lane)	NB	814	14	668	14
A452 Kenilworth Road (between Wootton Green Lane and Lavender Hall Lane)	SB	678	12	846	18
A452 Kenilworth Road (between Hallmeadow Road and Wootton Green Lane)	NB	817	14	665	14
A452 Kenilworth Road (between Hallmeadow Road and Wootton Green Lane)	SB	658	12	846	18
A452 Kenilworth Road (between Park Lane and Wootton Lane)	NB	890	16	740	16

	Direction	AM Peak		PM Peak	
		Vehicles	HGVs	Vehicles	HGVs
A452 Kenilworth Road (between Park Lane and Wootton Lane)	SB	750	13	934	20
A452 Kenilworth Road (between Bradnocks Marsh Lane and Park Lane)	NB	904	16	757	16
A452 Kenilworth Road (between Bradnocks Marsh Lane and Park Lane)	SB	770	14	928	20
A452 Kenilworth Road (between Bradnocks Marsh Lane and Marsh Lane)	NB	997	18	813	17
A452 Kenilworth Road (between Bradnocks Marsh Lane and Marsh Lane)	SB	804	14	1,071	23
A452 Kenilworth Road (between Windmill Lane and Kelsey Lane)	NB	644	11	698	15
A452 Kenilworth Road (between Windmill Lane and Kelsey Lane)	SB	598	11	628	13
A452 Kenilworth Road (between Gypsy Lane and Adler Lane)	NB	602	11	614	13
A452 Kenilworth Road (between Gypsy Lane and Adler Lane)	SB	638	11	696	15
A452 Kenilworth Road (between Meriden Road and Diddington Lane) NB	NB	977	45	979	60
A452 Kenilworth Road (between Meriden Road and Diddington Lane) SB	SB	1196	56	1,292	80
A452 Kenilworth Road (south of Meer End Road) NB	NB	512	9	420	9
A452 Kenilworth Road (south of Meer End Road) SB	SB	443	8	500	11

Table 5-161: Balsall Common and Hampton-in-Arden 2012 baseline flows (local road network)

		AM Peak		PM Peak	
		Vehicles	HGVs	Vehicles	HGVs
Windmill Lane between Hob Lane and Kenilworth Road	NB	173	1	154	1
Windmill Lane between Hob Lane and Kenilworth Road	SB	138	1	136	1
Windmill Lane between Hob Lane and Kelsey Lane	NB	114	0	167	1
Windmill Lane between Hob Lane and Kelsey Lane	SB	145	1	92	1
Hob Lane	EB	114	0	40	0
Hob Lane	WB	44	0	102	1

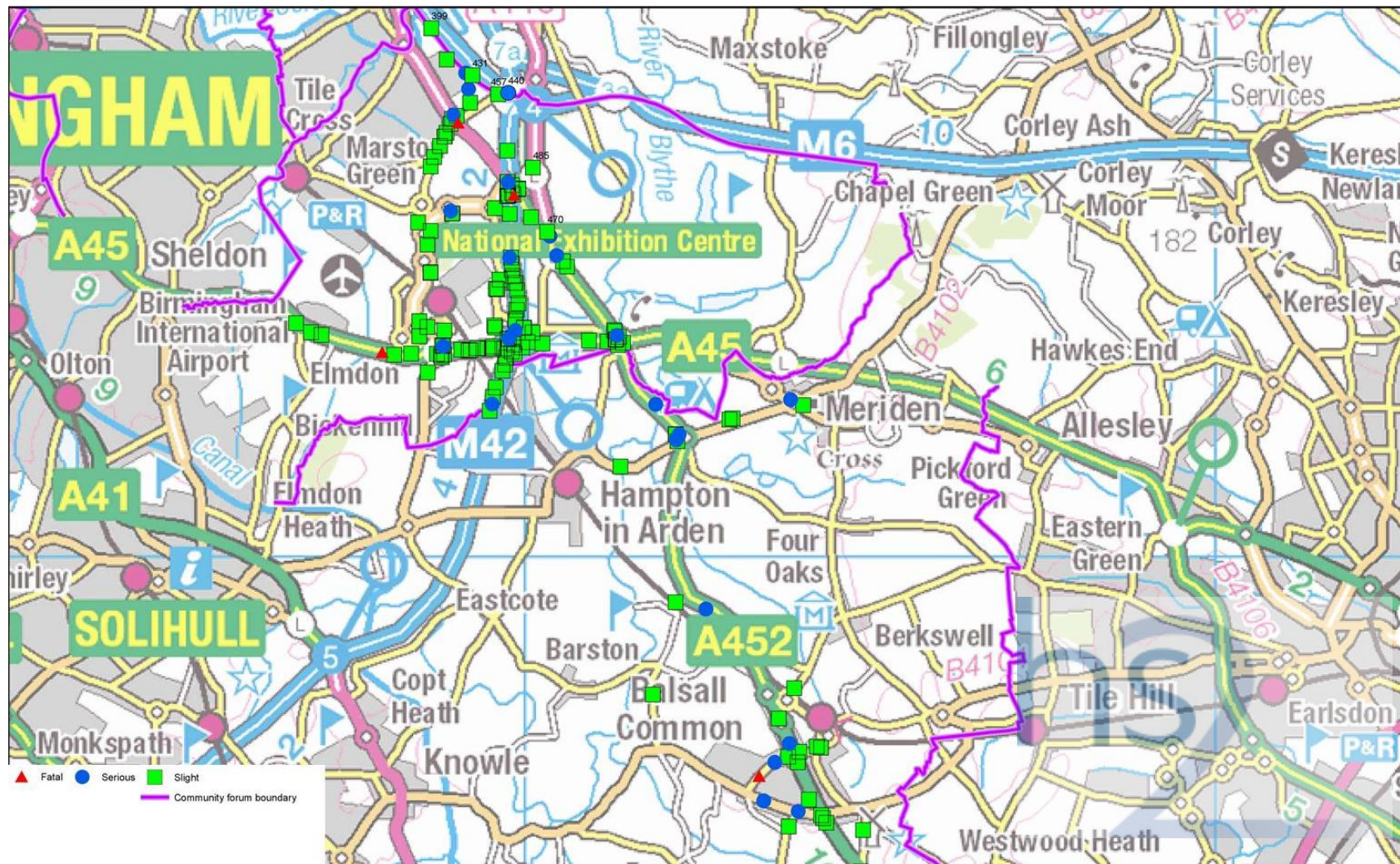
		AM Peak		PM Peak	
		Vehicles	HGVs	Vehicles	HGVs
Kelsey Lane between Kenilworth Road and Meeting House Lane	EB	347	2	188	1
Kelsey Lane between Kenilworth Road and Meeting House Lane	WB	242	1	331	2
Waste Lane	EB	430	2	259	2
Waste Lane	WB	279	2	356	2
Lavender Hall Lane between A452 Kenilworth Road and Hallmeadow Road	EB	93	0	86	1
Lavender Hall Lane between A452 Kenilworth Road and Hallmeadow Road	WB	106	0	78	1
Lavender Hall Lane between Hallmeadow Road and Park Lane	EB	135	0	102	1
Lavender Hall Lane between Hallmeadow Road and Park Lane	WB	187	1	131	1
Lavender Hall Lane between Park Lane and Spencer's Lane	EB	166	1	129	1
Lavender Hall Lane between Park Lane and Spencer's Lane	WB	187	1	132	1
Hallmeadow Road between Lavender Hall Lane and A452 Kenilworth Road	EB	91	0	89	1
Hallmeadow Road between Lavender Hall Lane and A452 Kenilworth Road	WB	121	0	108	1
Park Lane	EB	39	0	33	0
Park Lane	WB	2	0	4	0
Meriden Road between A452 Kenilworth Road and Diddington Lane	EB	287	2	356	2
Meriden Road between A452 Kenilworth Road and Diddington Lane	WB	308	2	335	2
Meriden Road west of Diddington Lane	EB	408	2	446	3
Meriden Road west of Diddington Lane	WB	313	2	362	2
Diddington Lane at Meriden Road	NB	126	0	121	1
Diddington Lane at Meriden Road	SB	10	0	23	0
Diddington Lane at A452 Kenilworth Road	EB	110	0	136	1
Diddington Lane at A452 Kenilworth Road	WB	23	0	8	0
Hampton Lane east of A452 Kenilworth Road	EB	356	2	506	3
Hampton Lane east of A452 Kenilworth Road	WB	322	2	403	3



## Accidents and safety

- 5.25.30 Accident data was obtained from SMBC and WCC for the three year period from June 2009 to May 2012.
- 5.25.31 A total of 37 PIA occurred over the three year period in the Balsall Common and Hampton-in-Arden CFA, an average of 12 per year. The locations of the accidents are shown on Figure 5-66 below.
- 5.25.32 Of the 37 accidents, 76% were classified as slight, 22% involved a serious injury and one accident was fatal. The highest number of accidents occurred on the A452 Kenilworth Road (8 accidents, with a further 7 accidents on the A452 at or south of its junction with the B4101 Balsall Street East/Kelsey Lane/Waste Lane) and Station Road (5 accidents, including the fatal accident and one of the serious injury accidents).
- 5.25.33 There are no clusters of accidents (nine or more, in the three year period).

Figure 5-66: Summary of accidents in the Balsall Common and Hampton-in-Arden study area



## Parking and loading

- 5.25.34 Public car parks and parking restrictions in the local area are shown on Figure 5-67.

### *Balsall Common*

- 5.25.35 In Balsall Common, there are 'no waiting at any time' restrictions along sections of the A452 and at the Station Road/Green Lane/Meeting House Lane junction and Limited Waiting restrictions along the shop frontages on Station Road. There are two public off-street car parks in the centre of Balsall Common, which can be accessed off the A452 and Station Road respectively.
- 5.25.36 Berkswell Station has a dedicated 'Park & Ride' car park with 82 car parking spaces, with No Waiting at any time restrictions on the station access roads.

### *Hampton-in-Arden*

- 5.25.37 There are no significant parking restrictions in Hampton-in-Arden and Hampton-in-Arden Station has a dedicated 'Park & Ride' car park with 68 car parking spaces.

### *Meriden*

- 5.25.38 In Meriden, there is a mix of on-street car parking, 'limited waiting' restrictions and 'no waiting at any time' restrictions.
- 5.25.39 The A452 is a clearway from the Hallmeadow Road junction to the Stonebridge Island junction (A45).



Figure 5-67: Public car parks and parking restrictions



## Public transport

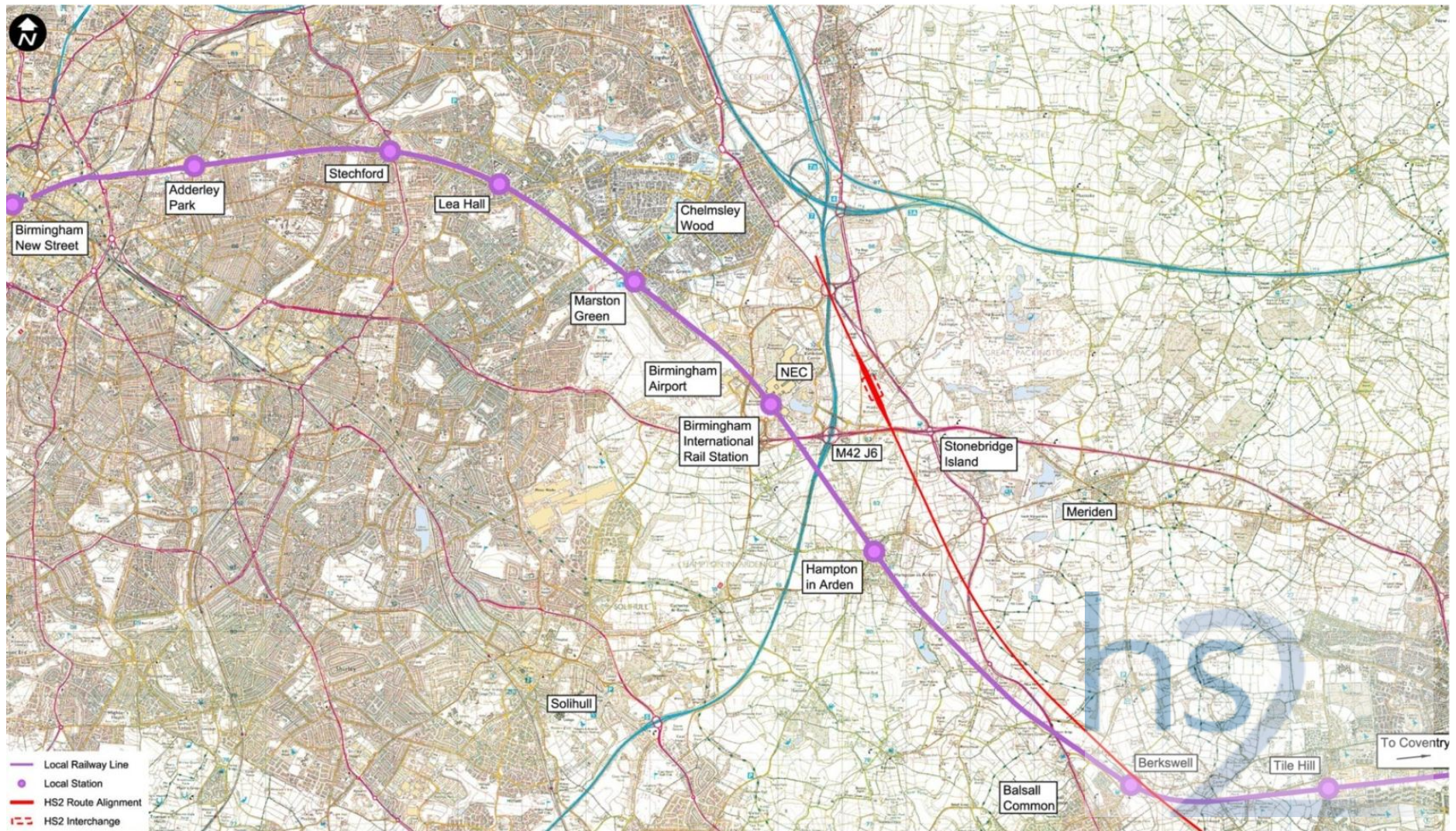
- 5.25.40 The area north of the Balsall Common and Hampton-in-Arden CFA (including Birmingham International Station and Interchange) is well served by public transport (by rail, bus and coach) and is included in the assessment of the Birmingham Interchange and Chelmsley Wood CFA . The Balsall Common and Hampton-in-Arden CFA is less well served by public transport, typical of rural areas, although there are rail stations at Berkswell and Hampton-in-Arden and buses serving Balsall Common, Hampton-in-Arden and Meriden.
- 5.25.41 The following sections describe the rail, bus and coach services in the Balsall Common and Hampton-in-Arden CFA.

### *Rail network*

- 5.25.42 The rail network is shown on Figure 5-68. The key railway station in the area is Birmingham International Station, but it is located to the north of the Balsall Common and Hampton-in-Arden CFA and is included in the assessment of Birmingham Interchange and Chelmsley Wood (CFA24).
- 5.25.43 Birmingham International Station is one of the principal rail stations on the West Coast Main Line and provides access to national and local rail services. The West Coast Main Line passes through the Balsall Common and Hampton-in-Arden CFA, with Berkswell and Hampton-in-Arden stations served by local train services only.
- 5.25.44 Berkswell Station (also serving Balsall Common) and Hampton-in-Arden Station (together with Birmingham International Station) provide access to local rail services. There are two trains per hour in each direction serving Berkswell and Hampton-in-Arden stations, with trains to Birmingham International Station, Birmingham New Street Station and intermediary local stations and to Coventry Station and intermediary local stations respectively.



Figure 5-68: Rail network



### *Local bus services*

- 5.25.45 The local bus network is shown on Figure 5-69 below.
- 5.25.46 There is a range of bus service provision in the area, but no long distance coach services. The spread of bus service coverage, across a rural area between Coventry and Solihull and serving villages and local communities, means that some areas have relatively low levels of provision, in terms of frequency or times of day/week when services operate, or the services are based around school bus services.

#### **Balsall Common**

- 5.25.47 As of September 2013 the bus routes serving Balsall Common include 6 school bus services and 6 public services. There are total of 71 buses (including 12 school buses) on a weekday and 48 buses on a Saturday. The bus services provide connections to Dorridge, Hampton-in-Arden, Kenilworth and Solihull. The buses are routed along the following roads:
- A452;
  - B4101;
  - Station Road/Truggist Lane;
  - Lavender Hall Lane;
  - Hallmeadow Road
  - Park Lane; and,
  - Gipsy Lane.



Figure 5-69: Bus routes that serve Balsall Common and Hampton-in-Arden CFA study area



5.25.48 The Balsall Common bus services are summarised in Table 5-162 below.

Table 5-162: Bus routes and frequencies – Balsall Common

Bus Service	Route	No. of Buses (One-Way)				
		Weekday			Saturday (All Day)	Sunday (All Day)
		AM Peak Hour	PM Peak Hour	Total All Day		
62*	Solihull – Warwickshire College	1	0	1	0	0
	Warwickshire College – Solihull	0	0	1	0	0
80*	Duggins Lane – Heart of England School	1	0	1	0	0
	Heart of England School – Duggins Lane	0	0	1	0	0
81*	Broad Lane – Heart of England School	1	0	1	0	0
	Heart of England School – Broad Lane	0	0	1	0	0
82*	Pickford Green – Heart of England School	1	0	1	0	0
	Heart of England School – Pickford Green	0	0	1	0	0
83*	Solihull – Meriden Green	1	0	1	0	0
	Meriden Green – Solihull	0	0	1	0	0
83	Solihull – Meriden Green via Balsall Common	0	0	3	0	0
	Balsall Common via Meriden Green	0	0	2	0	0

Bus Service	Route	No. of Buses (One-Way)				
		Weekday			Saturday (All Day)	Sunday (All Day)
		AM Peak Hour	PM Peak Hour	Total All Day		
84*	Eastern Green – Heart of England School	1	0	1	0	0
	Heart of England School – Eastern Green	0	0	1	0	0
84	Solihull – Kenilworth	0	0	1	0	0
	Kenilworth – Solihull	0	0	1	0	0
87C	Coventry – Berkswell	1	1	12	12	0
	Berkswell – Coventry	1	1	12	12	0
88	Solihull – Balsall Common via Knowle	1	1	12	12	0
	Balsall Common – Solihull via Knowle	1	0	12	12	0
233	Solihull – Kenilworth via Balsall Common	0	0	1	0	0
	Kenilworth – Solihull via Balsall Common	0	0	1	0	0
825	Catherine de Barnes – Balsall Common	1	0	1	0	0
	Balsall Common – Catherine de Barnes	0	0	1	0	0
Total		11	3	71	48	0

\* School Bus

### Hampton-in-Arden

5.25.49 As of September 2013 the bus routes serving Hampton-in-Arden include 1 school services and 3 public services. There are total of 34 buses (including 2 school buses) on a weekday and 24 buses at the weekend. The bus services provide connections to Balsall Common and Solihull. The buses are routed along the High Street and Meriden Road in Hampton-in-Arden. Table 5-163 summarises the bus services in Hampton-in-Arden.

Table 5-163: Bus routes and frequencies – Hampton-in-Arden

Bus Service	Route	No. of Buses (One-Way)				
		Weekday			Saturday (All Day)	Sunday (All Day)
		AM Peak Hour	PM Peak Hour	Total All Day		
82	Coventry – Solihull via Meriden	1	1	14	12	0
	Solihull via Meriden – Coventry	1	1	14	12	0
o84	Solihull – Kenilworth	1	0	1	0	0
	Kenilworth - Solihull	0	0	1	0	0
825	Catherine de Barnes – Balsall Common	1	0	1	0	0
	Balsall Common – Catherine de Barnes	0	0	1	0	0
CH2*	Solihull – King Edward Camp Hill School	0	0	1	0	0
	King Edward Camp Hill School – Solihull	0	0	1	0	0
Total		4	2	34	24	0

\*School Bus

**Meriden**

5.25.50 As of September 2013 the bus routes serving Meriden include 1 school services and 6 public services. There are total of 108 buses (including 2 school buses) on a weekday, 93 buses on a Saturday and 58 buses on a Sunday. The bus services provide connections to Balsall Common, Coleshill, Coventry, Hampton-in-Arden, Nuneaton, Solihull and Birmingham Airport. The buses are routed along the following roads:

- B4101;
- B4102; and
- Maxstoke Lane.

5.25.51 Table 5-164 summarises the bus services in Meriden.

Table 5-164: Bus routes and frequencies – Meriden

Bus Service	Route	No. of Buses (One-Way)				
		Weekday			Saturday (All Day)	Sunday (All Day)
		AM Peak Hour	PM Peak Hour	Total All Day		
82	Coventry – Solihull via Meriden	1	1	14	12	0
	Solihull via Meriden – Coventry	1	1	14	12	0
83	Solihull – Meriden via Balsall Common	0	0	3	0	0
	Meriden – Solihull via Balsall Common	0	0	2	0	0
83*	Solihull – King Edward Camp Hill School	1	0	1	0	0
	King Edward Camp Hill School – Solihull	0	0	1	0	0
84	Solihull – Kenilworth	0	0	1	0	0
	Kenilworth – Solihull	0	0	1	0	0
232	Nuneaton – Coleshill via Corley/Meriden	0	0	1	0	0
	Coleshill – Nuneaton via Corley/Meriden	0	0	1	0	0
900	Bham – Coventry via Airport/Meriden	2	2	34	34	29
	Coventry – Bham via Airport/Meriden	2	2	34	34	29
900A	Bham – Coventry	0	0	1	1	0
Total		7	6	108	93	58

### *Coach services*

- 5.25.52 There are no long distance coach services in the Balsall Common and Hampton-in-Arden CFA. Long distance coach services are available at Birmingham Airport located to the north of the Balsall Common and Hampton-in-Arden CFA and are included in the assessment of the Birmingham Interchange and Chelmsley Wood CFA.

### *Public transport interchanges*

There are no significant public transport interchange facilities in the Balsall Common and Hampton-in-Arden CFA. Birmingham International Station, which provides a multi-modal interchange, is located to the north of the Balsall Common and Hampton-in-Arden CFA and is included in the assessment of the Birmingham Interchange and Chelmsley Wood CFA.

### **Pedestrians, Cyclists and Equestrians**

- 5.25.53 The pedestrian and cycle network is shown on Figure 5-70 below.
- 5.25.54 Dedicated pedestrian and cycle facilities are limited due to the rural nature of the Balsall Common and Hampton-in-Arden CFA and the road network. The following sections identify the pedestrian and cycle facilities in the study area.

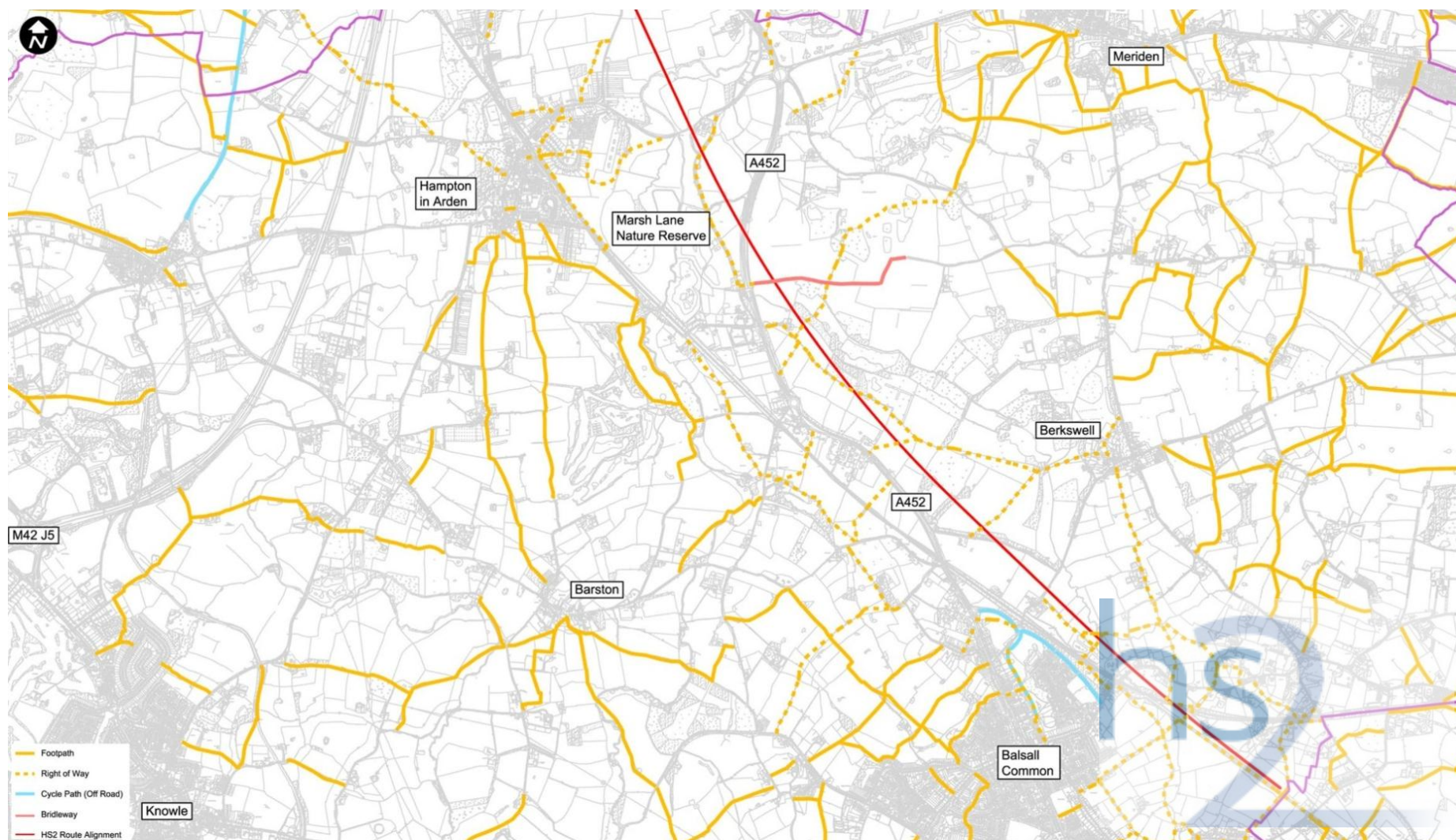
### *Pedestrian facilities*

#### **Balsall Common**

- 5.25.55 Within Balsall Common, the roads generally have footways, as is typical of such a built environment.
- 5.25.56 Kelsey Lane/Waste Lane (B4101) includes footways as far as the Old Waste Lane junction. To the east, there are no footways until circa 300m from the Hodgett's Lane junction. Truggist Lane has footways extending from the Hallmeadow Road roundabout, passing under the railway line and extending 100m to the east, but, beyond this point, there are no footways on Truggist Lane. Lavender Hall Lane has a footway between the A452 and Lavender Hall Park, but aside from facilities at the Hallmeadow Road/Lavender Hall Lane roundabout, to the east it has no footways until it reaches Berkswell. Hallmeadow Road has a footpath/ cycle path along its whole length, from the A452 roundabout to the Station Road/Truggist Lane roundabout. Park Lane has no footways.



Figure 5-70: Pedestrian and cycle facilities in the Balsall Common and Hampton-in-Arden CFA study area





- 5.25.57 In addition to the pedestrian facilities on the public highway, there are a number of PRow in the Balsall Common area and these include:
- Hob Lane to Hodgett's Lane, passing east of Beanit Spinney;
  - Hob Lane to Hodgett's Lane, passing northeast of Beanit Spinney;
  - Hob Lane to Waste Lane, passing northeast of Little Beanit Farm;
  - Old Waste Lane to Hodgett's Lane, crossing a dismantled railway and passing east of Beechwood Farm;
  - A network of routes from Meeting House Lane, Kelsey Lane, Old Waste Lane and Truggist Lane, crossing Sunnyside Farm and Barratt's Lane Farm before joining together and crossing a dismantled railway. The route continues east, splitting into two, with one route passing Truggist Hill Farm and the other passing Berkswell House. Both routes connect with Truggist Lane;
  - Truggist Lane/Lavender Hall Lane to Baulk Lane. The route connects with Truggist Lane, just to the west of Berkswell Station and heads north, before crossing a dismantled railway and passing through the Lavender Hall Fishery, where it joins the path from Lavender Hall Lane and the route to Baulk Lane;
  - Park Lane to Meriden Road, known as the 'Heart of England Way'. The route crosses The Roughs, passes south of Berkswell Hall and joins with a route to the northwest, which then crosses Sixteen Acre Wood and provides access to New Mercote Farm, Marsh Farm and the A452;
  - A452/Marsh Lane to Mercote Hall Lane. The route includes a branch to the south, connecting to the path to Marsh Farm and a route to the north crossing Mercote Hill Farm towards Cornets End Lane; and
  - Kenilworth Greenway which runs in a north-south direction to the west of Berkswell Station.

### **Hampton-in-Arden**

- 5.25.58 Within Hampton in Arden, the roads generally have footways, as is typical of such a built environment.
- 5.25.59 Meriden Road (B4102), the main road through Hampton in Arden, includes a footway as far as the junction with Diddington Lane. East from Diddington Lane, there is limited provision, with a narrow footpath provided on the bridge over the River Blythe and a narrow footpath in the verge 150m east of Patrick Farm to the roundabout junction with the A452. Diddington Lane has a footway extending from Hampton-in-Arden to the edge of the built environment, but there is no footway beyond this point to the north and east.
- 5.25.60 There are a number of PRow in the Hampton in Arden area and these include:
- Meriden Road to Marsh Lane, passing through Patrick Farm and the Marsh

Lane Nature Reserve;

- Meriden Road to Fentham Road, via a bridge over the West Coast Main Line and Siden Hill Wood;
- Diddington Lane to Meriden Road; and
- Diddington Lane to the A45 Coventry Road.

## Meriden

5.25.61 In Meriden, Hampton Lane has a footway on its north side, from the roundabout junction with the A452 to the roundabout junction with the B4104, where it connects into a network of footpaths in the village centre.

5.25.62 There is a network of PRoW on the south side of Meriden, connecting Hampton Lane with Berkswell Road and Cornets End Lane.

## *Non-motorised user flows*

5.25.63 Table 5-165 below lists the survey locations/routes where use by pedestrians, cyclists and horses exceeded 20 per day.

Table 5-165; Non-Motorised user Survey Locations

Description of Location	Max Number of Daily users
Truggist Lane	162
Park Lane	23
Off the A452 near Sixteen Acre Wood	32
Off the A452 near Marsh Farm	36
Meriden Road	110
Kenilworth Greenway	192
Private Road (Off Marsh Lane)	23

5.25.64 In total, 20 usage surveys were undertaken in August and September in the Balsall Common and Hampton-in-Arden CFA. 15 of the routes were used by less than 20 people in the 10 hour survey period. The routes with the greatest usage in the Balsall Common and Hampton-in-Arden CFA were Truggist Lane with 162 users, Kenilworth Greenway with 192 users and Meriden Road with 110 users. Both the routes provide local access.

5.25.65 Three routes were surveyed in September in the Balsall Common and Hampton-in-Arden CFA. None of the surveyed routes were used by more than 20 people in the 12 hour survey period.

### *Cycle facilities*

#### **Balsall Common**

- 5.25.66 In Balsall Common, in addition to the off road footpath/cycle path along Hallmeadow Road, there are a network of advisory cycle routes in Balsall Common. These include the following roads:
- Lavender Hall Lane, between the A452 and Hallmeadow Road, where it joins the off-road cycle path.
  - Station Road/Truggist Lane, from Balsall Street to Berkswell (via Baulk Lane), Carol Green and beyond.
  - Meeting House Lane, between Station Road and Kelsey Lane.
  - Windmill Lane, from Kelsey Lane to Hob Lane, where the route continues. There is a path link between the Meeting House Lane route and Windmill Lane, where you should 'walk your bike'.

#### **Hampton-in-Arden**

- 5.25.67 In Hampton-in-Arden, there is a network of advisory cycle routes and these include the following roads:
- Diddington Lane.
  - Meriden Road, from Diddington Lane to High Street.
  - Old Station Road, from Meriden Road towards junction 6 of the M42. The route connects with Eastway via a path where you should 'walk your bike'.
  - High Street, connecting to Solihull Road and Eastcote Lane.

#### **Meriden**

- 5.25.68 On the northwest side of Meriden, there is an off-road footway/cycleway on Maxstoke Lane, between the Birmingham Road and Shepherds Lane. There is also an off-road footpath/cycle path just to the east, connecting to the village centre via the old Maxstoke Lane.
- 5.25.69 Within Meriden, Main Road is an advisory cycle route, linking Berkswell Road and the old Maxstoke Lane.

### *Equestrian facilities*

- 5.25.70 There is one bridleway in the local area and this is shown on Figure 5-70.
- 5.25.71 The bridleway is located north of Balsall Common and east of Hampton-in-Arden. Its west end is accessed off the A452 Kenilworth Road opposite Marsh Lane and the eastern end is accessed off Mercote Hall Lane. The bridleway has a bound surface and provides access to Mercote Mill Farm.

### **Waterways/canals**

- 5.25.72 There are no navigable waterways or canals in the local area.

### **Air transport**

- 5.25.73 Birmingham Airport is located to the north of the Balsall Common and Hampton-in-Arden CFA and is included in the assessment for the Birmingham Interchange and Chelmsley Wood (CFA24).

## 5.26 Birmingham Interchange and Chelmsley Wood (CFA24)

### Study area

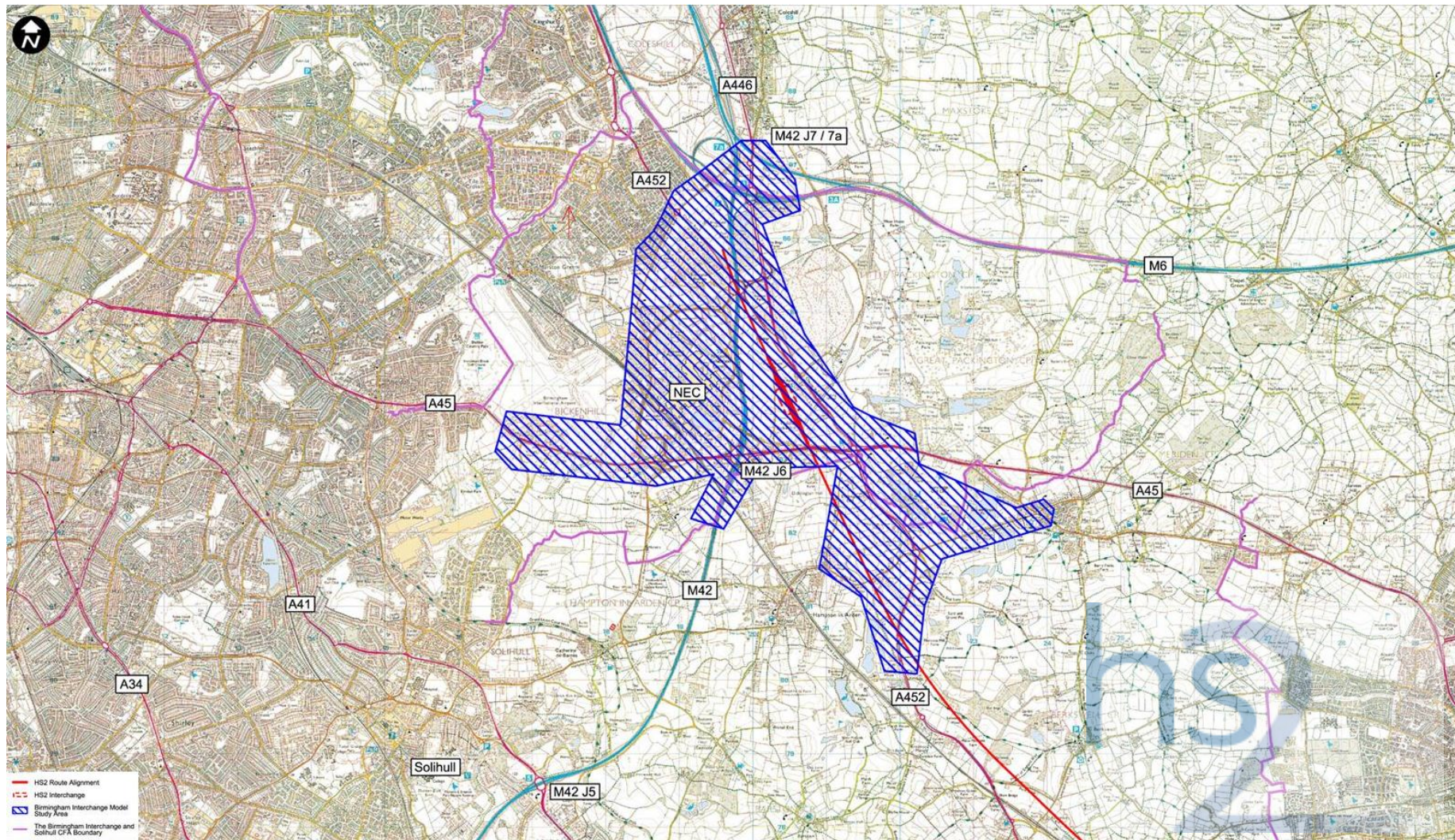
- 5.26.2 This section provides an overview of the baseline traffic and transport conditions for the section of Proposed Scheme that passes through the Birmingham Interchange and Chelmsley Wood CFA, also referred to as the study area for the purposes of this CFA.
- 5.26.3 It describes the transport infrastructure in the CFA which would be affected, either by the construction or operation of the Proposed Scheme. For this area, the baseline conditions relate to the transport network affected by construction of the proposed Birmingham Interchange station, rail corridor and automated people mover, along with the operational impacts of the proposed station.
- 5.26.4 The scope of work and study area has been discussed with the key transport authorities, including SMBC, Birmingham CC, CCC, WCC, Centro and the HA.
- 5.26.5 The location of the key transport infrastructure can be found in Figure 2, Volume 2 (CFA24 Report) with the road network Figure 5-71 identifying the core study area for the Birmingham Interchange and Chelmsley Wood CFA, including the M42 junction 6, A45 Coventry Road from west of Damson Parkway to east of Stonebridge Island, A452 Chester Road, A446 Stonebridge Road, Coleshill Heath Road, Birmingham Airport approach roads and NEC approach and circulation routes.
- 5.26.6 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from south to north along the proposed route. In addition, some modes of transport have been broken down into areas, including:
- Middle Bickenhill, which represents the environs immediately around the Birmingham Interchange Station site;
  - Elmdon, which covers Birmingham Airport, Birmingham International station and the National Exhibition Centre (NEC); and
  - Chelmsley Wood, which covers the area to the north of Elmdon.

### Local land uses

- 5.26.7 The proposed route alignment in the Birmingham Interchange and Chelmsley Wood CFA will pass through primarily agricultural land. The proposed Birmingham Interchange station is also located on land predominantly used for farming. The automated people mover crosses agricultural land and land occupied by the NEC, Birmingham International Station and Birmingham Airport.



Figure 5-71: Birmingham Interchange and Chelmsley Wood CFA study area





## Surveys

- 5.26.8 Traffic, non-motorised user and station surveys were undertaken in June 2012 and June 2013 and the survey locations are shown in Annex B(v).

### *Traffic surveys*

- 5.26.9 The traffic surveys comprised:
- MCC and queue length surveys at highway junctions. Surveys were undertaken on a weekday between 07:00 and 10:00 and 16:00 and 19:00;
  - traffic signal surveys including staging, green times, intergreens, cycle times and saturation flows at signal controlled junctions. Surveys were undertaken for the same time periods as the MCCs;
  - ATC on highway links across the study area. Wherever possible, ATC data was gathered for a continuous two week period to coincide with the date of the MCCs; and
  - journey time surveys on key routes and sections of the highway network, for 07:00-10:00 and 16:00-19:00.
- 5.26.10 The traffic survey data has been further supplemented by traffic data extracted from the HA's TRADS database which collects continuous data at various locations around the network.

The traffic data showed that for the study area the weekday AM peak hour was 08:00-09:00 and the PM peak hour was 17:00-18:00.

### *Non-motorised user surveys*

- 5.26.11 Non-motorised user surveys were undertaken in August and September 2012 to establish the usage of PRoW including roads, in the area of the Proposed Scheme. The surveys included:
- all roads and associated footways intersected by the proposed line of the route.
  - green corridors including footpaths, cycleways, bridleways, river and canal paths.
- 5.26.12 The August surveys were carried out between 08:00 and 18:00 on a weekend to capture leisure users. The September surveys were undertaken between 07:00 and 19:00 on a weekday to capture school and commuting users. September surveys were carried out on the routes that were identified as having a school or commuting use. Where possible, this was identified through discussions with the local highway authority.



### *Station surveys*

- 5.26.13 Birmingham International Station surveys were carried out on a weekday between 06:00 and 21:00 and included:
- parking accumulation and vehicle occupancy surveys at the long stay station car park;
  - private car drop off/pick up surveys in the short stay car park and in the vicinity of the station entrance. The data recorded included the number of vehicles; dwell time and number of people picked up and dropped off;
  - taxi drop off/pick up surveys at the station. The data recorded included the number of taxis, dwell time and number of people picked up and dropped off;
  - bus passenger surveys at the station entrance;
  - pedestrian counts (both directions) inside and outside the station. The following locations were surveyed:
    - at the top of the escalators at the station entrance;
    - at the People Mover platform;
    - at the NEC entrance/exit; and
    - on the pedestrian routes to the station.
  - interview surveys carried out between 07:00 and 10:00 and 16:00 and 19:00 at the following locations:
    - at the station link to the NEC; and
    - in the main station passenger waiting area.
- 5.26.14 The interview surveys of long distance rail travellers gathered data on mode of travel to/from the station, origin and destination, frequency of trip and journey purpose.

### *Highway network*

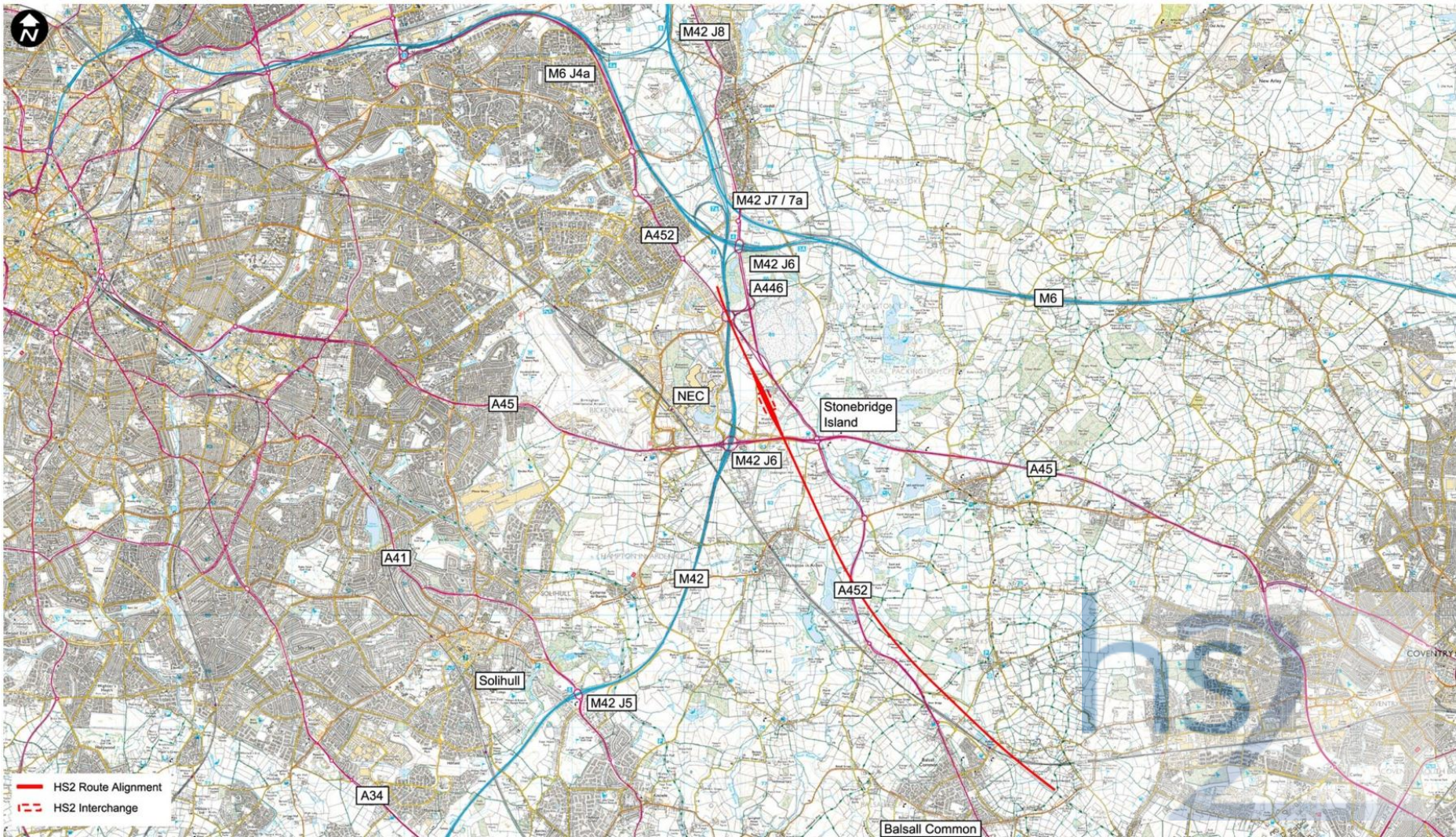
- 5.26.15 The following section describes the roads that would be affected by the Proposed Scheme, either at the construction or operational stage. The proposed Birmingham Interchange site is well connected to the strategic road network with the M42, M6, A45, A452 and A446 within 1.5km. The key junctions forming access to the station would be the M42 junction 6, M6 junction 4 and Stonebridge Island.

### *Strategic road network*

- 5.26.16 The strategic road network is shown on Figure 5-72 below.



Figure 5-72: Strategic road network





### **Motorway network**

- 5.26.17 The M42 is a dual three lane motorway, which forms the southern and eastern sections of the motorway 'box' around Birmingham. Junction 6 of the M42 is a grade separated six-arm signal controlled roundabout, which provides access to the A45 Coventry Road, the NEC and National Motorcycle Museum. Junction 6 also provides access, indirectly, to Birmingham Airport.
- 5.26.18 Approximately 3.5km to the north of junction 6 are the on and off slips to the M6 north (junction 7). The off slip to the M6 south (junction 7A) is a further 0.5km to the north, with the on slip 3km further north.
- 5.26.19 Between junctions 3A and 7A, the M42 has Active Traffic Management in operation with hard shoulder running at peak times.
- 5.26.20 The M6 is a dual three lane motorway which forms the northern section of the motorway 'box'. Junction 4 of the M6 is located just to the east of the M6/M42 interchange and is a grade separated four-arm partially signalised roundabout which provides access to the A446 Stonebridge Road.

### **Primary 'A' roads**

- 5.26.21 The A45 Coventry Road is generally a dual two lane carriageway road linking Birmingham City Centre to Solihull, the M42, Coventry and the M1. The A45 provides access to Birmingham Airport, Birmingham International station and the NEC, which are all located to the west of the M42 junction 6 and within 1.5km.
- 5.26.22 Approximately 1.5km to the east of the M42 is Stonebridge Island, which is a grade separated roundabout beneath the A45. Stonebridge Island forms the intersection between the A45 and A452 Chester Road/Kenilworth Road.
- 5.26.23 Between the M42 and Stonebridge Island, the A45 has two ahead lanes and a third lane in each direction for traffic leaving the A45 for the M42 junction 6 and Stonebridge Island. The A45 speed limit is generally 60mph in the Solihull area.
- 5.26.24 The A452 connects Kenilworth to Sutton Coldfield and is a dual two lane carriageway road with a 50mph speed limit to the south of Stonebridge Island. Diddington Lane joins the A452 between Meriden Road and Stonebridge Island.
- 5.26.25 From Stonebridge Island to the north, the A452 is a dual two lane carriageway road where the national speed limit applies.
- 5.26.26 Packington Lane joins with the A452 via a left in/left out arrangement on the northbound and southbound carriageways. The left in/left out on the northbound carriageway also serves Middle Bickenhill Lane, via a road running parallel to the A452.

- 5.26.27 There are on and off slips to the A446 Stonebridge Road approximately 1.5km north of Stonebridge Island and a five-arm roundabout above the M42 a further 1km to the north. The five-arm roundabout forms the junction between the A452, A446, Birmingham Business Park and Bickenhill Parkway.
- 5.26.28 As the A452 passes the Birmingham Business Park to the north of the five-arm roundabout, it is downgraded to a two lane single carriageway road, with a 50mph speed limit until it connects with Coleshill Heath Road via a four-arm roundabout. As the A452 enters the north Solihull area it returns to a dual two lane carriageway and has a 50mph speed limit.
- 5.26.29 The A446 is a dual two lane carriageway road for most of its length from the intersection with the A452 to the north. The A446 connects with the M6 at junction 4, which is approximately 2.5km north of Stonebridge Island and there is a three-arm roundabout with Coleshill Heath Road located a further 300m to the north.

### *Local road network*

- 5.26.30 The local road network is shown on Figure 5-73.
- 5.26.31 Between Stonebridge Island and the M42 junction, the Coventry Road runs along the south side of the A45. The Coventry Road has two lanes and is one way westbound. It is accessed off the Stonebridge Island westbound exit slip road onto the A45. The road provides access to Pasture Farm and the Bickenhill Waste Recycling Centre. The two lanes fork just to the west of the recycling centre, with one lane joining the A45 off slip to junction 6 of the M42 and the other lane forming the Eastway access to the NEC.
- 5.26.32 Eastway passes under the Coventry Road and the A45 before it continues as a two-way carriageway towards the west and one way towards the east. The eastern section of Eastway provides an exit from the NEC connecting with the A45 eastbound off slip to Stonebridge Island. The western section of Eastway provides access to the NEC (Pendigo Way), connecting with the A45 eastbound on slip from junction 6 and M42 southbound off slip before passing over the M42.
- 5.26.33 Middle Bickenhill Lane is a narrow single carriageway rural road that connects Eastway to the A452 northbound carriageway and Packington Lane. It serves a small number of residential properties.
- 5.26.34 Packington Lane is a single carriageway rural road, providing access to Little Packington and surrounding rural areas to the east of the A452. It can be accessed off the A452 northbound and southbound carriageways.

Pendigo Way connects to Northway and Southway within the NEC complex. Pendigo Way and Northway provide access to car parking and loading areas. Southway provides access for the NEC off junction 6 of the M42.



Figure 5-73: Local road network





- 5.26.35 Bickenhill Parkway/Bickenhill Lane is a dual two lane carriageway road, which enables access to Birmingham International station, Birmingham Airport, local businesses and industrial estates and parts of the NEC.
- 5.26.36 Birmingham Airport is accessed off the A45 via dedicated inbound/outbound slip roads, with additional access off Airport Way (via the A45 and Bickenhill Lane), which is a two lane dual carriageway road. Birmingham International Station is accessed via the A45 and Bickenhill Lane and the Station Link Road, which is a single two lane carriageway. Bickenhill Lane connects to the A45 at Clock Island.

### *Baseline conditions*

- 5.26.37 The operation of the key junctions within the CFA area have been analysed for the 2012 existing conditions and the results for the peak periods are summarised below.
- 5.26.38 The network in the area includes a number of strategic links including M42, M6, A45, A452 and the A446. Table 5-166 summarises the 2012 AM and PM peak hour forecast traffic flows for each location.

Table 5-166: 2012 baseline strategic road network AM and PM peak hour traffic flows (vehicles)

	Direction	AM Peak		PM Peak	
		Vehicles	HGVs	Vehicles	HGVs
A446 (Stonebridge Road) between M6 junction 4 and slips to A452	NB	1,040	64	1,662	77
A446 (Stonebridge Road) between M6 junction 4 and slips to A452	SB	1,837	113	1,411	66
A452 (Chester Road) between Birmingham Business Park Roundabout and Melbicks	SB	713	44	949	44
A452 (Chester Road) between Birmingham Business Park Roundabout and Melbicks	NB	785	48	495	23
A446 North of A452 slips	NB	1,043	64	1,110	52
A446 North of A452 slips	SB	1,169	72	1,252	58
A452 Between Packington Lane and Stonebridge Roundabout	NB	1,809	112	1,542	72
A452 Between Packington Lane and Stonebridge Roundabout	SB	1,944	120	2,218	103
A45 East of Stonebridge Roundabout	EB	1,598	99	2,267	105
A45 East of Stonebridge Roundabout	WB	2,326	144	2,303	107
A45 between M42 junction 6 and Stonebridge Roundabout	EB	2,169	134	2,404	112



	Direction	AM Peak		PM Peak	
		Vehicles	HGVs	Vehicles	HGVs
A45 between M42 junction 6 and Stonebridge Roundabout	WB	2,711	167	2,982	139
M42 south of junction 6	NB	5,026	292	5,350	252
M42 south of junction 6	SB	5,304	308	5,608	264
M42 north of junction 6	NB	4,026	234	5,567	262
M42 north of junction 6	SB	5,668	329	4,986	235
A452 (Chester Road) between Birmingham Business Park Roundabout and Coleshill Heath Road	SEB	1,207	75	614	29
A452 (Chester Road) between Birmingham Business Park Roundabout and Coleshill Heath Road	NWB	464	29	1,094	51
M42 J6 Northbound off slip	NB	2,082	121	1,409	66
M42 J6 Southbound on slip	SB	1415	82	1864	88
A45 west of Damson Parkway	EB	1,933	119	1,986	92
A45 west of Damson Parkway	WB	1,661	103	2,127	99
A45 between Damson Parkway and Clock Junction	EB	1,984	122	2,014	94
A45 between Damson Parkway and Clock Junction	WB	1,949	120	2,469	115
A45 between Clock junction and M42 Junction 6	EB	1,835	113	3,033	141
A45 between Clock junction and M42 Junction 6	WB	2,955	182	2,894	134
Link from M42 northbound to M6 northbound	NB	1,010	59	1,147	54
Link Road from M42 northbound to M6 eastbound		880	51	838	39
Link road between M6 westbound and M42 southbound	WB	685	40	728	34
M42 north of link road to M6 eastbound	NB	2,437	142	3,708	174
M42 north of link road to M6 eastbound	SB	4,437	258	4,161	196
M6 West of junction 4	SB	2,661	155	2,989	141
M6 West of junction 4	NB	3,247	189	3,523	166
M6 East of junction 4	EB	2,996	174	3,530	166

	Direction	AM Peak		PM Peak	
		Vehicles	HGVs	Vehicles	HGVs
M6 East of junction 4	WB	3,391	197	3,138	148
M6 south bound off slip at junction 4	SB	933	54	793	37
M6 junction 4 on slip	EB	414	24	708	33
M6 junction 4 on slip	WB	441	26	669	31
M6 junction WB traffic approaching roundabout	WB	572	33	387	18
M6 junction 4 through junction traffic WB	WB	2,134	124	2,023	95
A452 (Kenilworth Road) south of Stonebridge Roundabout	NB	1,044	64	1,102	51
A452 (Kenilworth Road) south of Stonebridge Roundabout	SB	1,239	76	1,315	61
A452 (Chester Road) north of junction with A446	NB	785	48	495	23
A452 (Chester Road) north of junction with A446	SB	727	45	916	43
A446 Slips from Birmingham Business Park Roundabout	EB	126	8	579	27
A446 Slips to Birmingham Business Park Roundabout	WB	668	41	159	7
A446 between Coleshill Heath Road and M6 junction 4	SB	1,206	74	1,050	49
A446 between Coleshill Heath Road and M6 junction 4	NB	1,199	74	1,659	77
A446 between Coleshill Heath Road and Coventry Road	NB	1,294	80	1,621	75
A446 between Coleshill Heath Road and Coventry Road	SB	1,562	96	1,165	54
Chester Road west of Coleshill Heath Road	EB	1,187	73	711	33
Chester Road west of Coleshill Heath Road	WB	852	53	1,350	63

5.26.39 Table 5-167 summarises 2012 baseline AM and PM peak hour traffic flow on a number of local roads in the area.

Table 5-167: 2012 baseline local road network AM and PM peak hour traffic flows (vehicles)

	Direction	AM Peak		PM Peak	
		Vehicles	HGVs	Vehicles	HGVs
A45 westbound service road between Stonebridge Roundabout and East Way	WB	146	4	116	2
A45 westbound service road between East Way and M42 junction 6	WB	110	3	74	1
East Way on link from A45 slip after Diddington Lane	NB	27	1	27	0
East Way	EB	73	2	73	1
East Way link to A45 eastbound off slip at Stonebridge Roundabout	EB	93	2	104	2
South Way between M42 junction 6 and Pendigo Way	NB	406	12	244	5
South Way between M42 junction 6 and Pendigo Way	SB	138	4	254	5
Northway between North Avenue and North Car Park roundabout	NB	291	9	301	6
Northway between North Avenue and North Car Park roundabout	SB	189	6	112	2
B4438 between Northway and Birmingham Business Park Roundabout	NB	589	18	576	12
B4438 between Northway and Birmingham Business Park Roundabout	SB	499	15	439	9
Solihull Parkway	EB	111	3	1,311	22
Solihull Parkway	WB	1,533	38	94	2
Bickenhill Parkway west of Holiday Inn	EB	394	12	402	9
Bickenhill Parkway west of Holiday Inn	WB	391	12	372	8
Bickenhill Lane between Starley Way and Morris Way	NB	1,001	30	1,094	23
Bickenhill Lane between Starley Way and Morris Way	SB	790	24	780	17
Station Link Road between Trinity Park and Bickenhill Lane	EB	693	21	177	4
Station Link Road between Trinity Park and Bickenhill Lane	WB	233	7	741	16
Bickenhill Lane between Station Link Road and Clock Junction	NB	1,104	33	588	13
Bickenhill Lane between Station Link Road and Clock Junction	SB	808	25	1,661	35

	Direction	AM Peak		PM Peak	
		Vehicles	HGVs	Vehicles	HGVs
Link from A45 slip to Bickenhill Lane	NB	419	13	352	8
Airport Way between Viking Road and Bickenhill Lane	EB	406	12	700	15
Airport Way between Viking Road and Bickenhill Lane	WB	266	8	313	7
A45 eastbound on slip from Airport roundabout	EB	308	19	747	35
A45 westbound off slip to Airport Roundabout	WB	630	39	668	31
Airport Way between Viking Road and Hermes Road	NB	606	15	781	13
Airport Way between Viking Road and Hermes Road	SB	498	12	1,005	17
Coleshill Heath Road between Chester Road and Yorkminster Drive	NB	378	11	526	11
Coleshill Heath Road between Chester Road and Yorkminster Drive	SB	615	19	535	11
Coleshill Heath Road between Yorkminster Drive and Stonebridge Road	EB	429	13	529	11
Coleshill Heath Road between Yorkminster Drive and Stonebridge Road	WB	625	19	571	12

## M42 junction 6

5.26.40 Table 5-168 shows the existing operation of M42 junction 6 in the weekday AM and PM peak hour.

Table 5-168: M42 junction 6 peak hour queue lengths (metres)

	AM Peak		PM Peak	
	Ave	MMQ	Ave	MMQ
M42 North off-slip	14	89	10	79
A45 East off-slip	11	82	16	91
M42 South off-slip	14	77	9	51
A45 West off-slip	9	63	17	123
Southway – Left Turn	6	43	5	43
Southway – Ahead	4	48	7	48

- 5.26.41 The table shows that the longest queues occur on the M42 and A45 approaches. The maximum queue lengths can be accommodated within the available storage on the M42 and A45 slip-roads.

### M6 junction 4

- 5.26.42 Table 5-169 shows the existing operation of M6 junction 4 in the weekday AM and PM peak hour.

Table 5-169: M6 junction 4 peak hour queue lengths (metres)

	AM Peak		PM Peak	
	Ave	MMQ	Ave	MMQ
A446 Stonebridge Road (North)	3	56	3	68
M6 East off-slip	8	72	3	38
A446 Stonebridge Road (South)	1	60	7	114
M6 West off-slip	14	102	96	289

- 5.26.43 The table shows that the longest queue occurs on the A446 (North) approach. The maximum queue lengths can be accommodated within the available storage on the M6 slip-roads and the A446 without affecting upstream junctions.

### Stonebridge Island

- 5.26.44 Table 5-170 shows the existing operation of Stonebridge Island in the weekday AM and PM peak hour.

Table 5-170: Stonebridge Island peak hour queue lengths (metres)

	AM Peak		PM Peak	
	Ave	MMQ	Ave	MMQ
A452 Chester Road	21	168	19	204
A45 East off-slip	31	119	15	88
A452 Kenilworth Road	3	63	3	59
A45 West off-slip – Left Turn	52	339	17	190
A45 West off-slip – Ahead	50	339	22	199

- 5.26.45 The table shows that the longest queues occur on the A45 West approach. The maximum queue lengths can be accommodated on the A45 and A452 without affecting upstream junctions.

### A45 Coventry Road/Damson Parkway

- 5.26.46 Table 5-171 shows average and maximum queues at the A45 Coventry Road/Damson Parkway traffic signal junction in the weekday AM peak hour.

Table 5-171: A45 Coventry Road/Damson Parkway peak hour queue lengths (metres)

	AM Peak		PM Peak	
	Ave	MMQ	Ave	MMQ
Terminal Road – Left Turn	27	87	41	106
Terminal Road – Ahead/Right Turn	16	88	33	108
A45 Coventry Road (East) – Ahead	18	103	24	146
A45 Coventry Road (East) – Right Turn	27	97	20	97
Damson Parkway – Left Turn	5	30	8	47
Damson Parkway – Ahead/Right Turn	32	148	22	96
A45 Coventry Road (West) – Ahead	36	249	35	242
A45 Coventry Road (West) – Right Turn	46	204	18	123

5.26.47 The tables above show that in the AM peak hour queues are forecast to develop on the A45 Coventry Road west approach to the junction.

5.26.48 In the PM peak hour queues develop on the A45 Coventry Road west and Damson Parkway approaches to the junction.

### **A452 Chester Road/B4438 Bickenhill Parkway**

5.26.49 Table 5-172 shows average and maximum queues at the A452 Chester Road/B4438 Bickenhill Parkway roundabout junction (Birmingham Business Park) in the weekday AM peak hour.

Table 5-172: A452 Chester Road / B4438 Bickenhill Parkway peak hour queue lengths (metres)

	AM Peak		PM Peak	
	Ave	MMQ	Ave	MMQ
A446 north slips	3	71	0	19
A452 Chester Road south	9	103	0	27
B4438 Bickenhill Parkway	6	104	0	23
Solihull Parkway	0	10	6	74
A452 Chester Road north	0	24	4	73



5.26.50 The tables above show that in the AM peak hour there are no significant queues at the junction. Queues develop on the A446 north slips, A452 Chester Road south and B4438 Bickenhill Parkway as a result of traffic accessing Birmingham Business Park but queues are contained in the available storage capacity.

5.26.51 In the PM peak hour significant queues are forecast on the junction particularly on Solihull Parkway and the A452 Chester Road north

### **A45 Coventry Road/B4438 Catherine-de-Barnes Lane**

5.26.52 Table 5-173 shows average and maximum queues at the A45 Coventry Road/B4438 Catherine-de-Barnes Lane roundabout junction in the weekday AM peak hour.

Table 5-173: A45 Coventry Road/B4438 Catherine-de-Barnes Lane peak hour queue lengths (metres)

	AM Peak		PM Peak	
	Ave	MMQ	Ave	MMQ
B4438 Bickenhill Lane	0	21	0	20
A45 east off-slip	2	56	5	65
B4438 Catherine De Barnes	2	44	1	32
A45 west off-slip	0	13	0	11

5.26.53 The tables above show that in the AM peak hour there are no significant queues developing on the junction.

5.26.54 In the PM peak hour queues develop on the A45 east off-slip, however these are contained within the length of the off-slip and do not impact on the flow on the A45 Coventry Road mainline.

### **A452 Chester Road/Coleshill Heath Road roundabout**

5.26.55 Table 5-174 shows average and maximum queues at the A452 Chester Road/Coleshill Heath Road roundabout in the weekday AM peak hour.

Table 5-174: A45 Coventry Road/B4438 Catherine-de-Barnes Lane peak hour queue lengths (metres)

	AM Peak		PM Peak	
	Ave	MMQ	Ave	MMQ
Coleshill Heath Road (north)	71	307	3	117
Chester Road (east)	0	45	1	81
Coleshill Heath Road (south)	5	95	9	131
Chester Road (west)	4	98	0	0

- 5.26.56 The tables above show that in the AM peak hour queues presently form on the Coleshill Heath Road north. These queues are transient as the average queues are significantly shorter than the maximum queues.
- 5.26.57 Typically queues are not as significant in the PM peak hour and are generally contained without blocking any major upstream junctions.

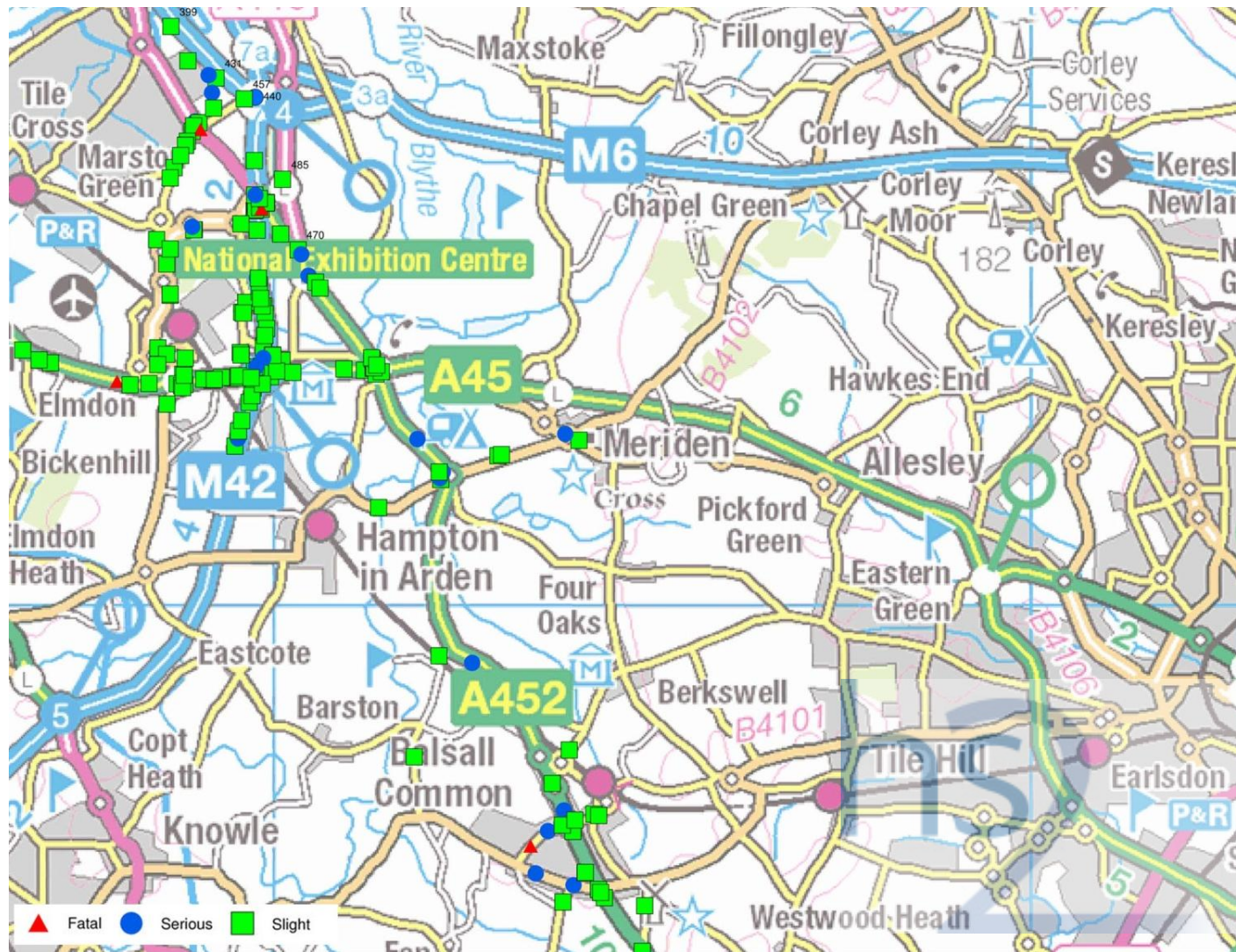
### Accidents and safety

- 5.26.58 Accident data was obtained from SMBC and WCC for the three year period from June 2009 to May 2012.
- 5.26.59 A total of 135 PIA occurred over the three year period in the Birmingham Interchange and Chelmsley Wood CFA, an average of 45 per year. The locations of the accidents are shown on Figure 5-74 below.
- 5.26.60 Of the 135 accidents, 87% were classified as slight, 11% involved a serious injury and 2% were fatal accidents. The highest number of accidents occurred on the A45 Coventry Road (32 accidents), M42 (31 accidents), A452 Chester Road (18 accidents) and Coleshill Heath Road (10 accidents).
- 5.26.61 Table 5-175 below shows a summary of the accidents at the locations where there were clusters of accidents (nine or more, in the three year period).

Table 5-175: Summary of accidents in the Birmingham Interchange and Chelmsley Wood CFA study area (June 2009 to May 2012)

Location	Year			Severity			Total
	Yr 1	Yr 2	Yr 3	Fatal	Serious	Slight	
A45 Coventry Road	12	13	7	1	1	30	32
M42 (Mainline)	17	8	6	0	5	26	31
A452 Chester Road	8	4	6	2	5	11	18
Coleshill Heath Road	3	2	5	0	0	10	10
Bickenhill Lane	2	4	3	0	1	8	9

Figure 5-74: Summary of accidents in the Birmingham Interchange and Chelmsley Wood CFA study area (June 2009 to May 2012)



## Parking and loading

- 5.26.62 There are no formal parking facilities in the Middle Bickenhill area. In the area around Birmingham Airport, Birmingham International station and the NEC, there are extensive areas of surface level car parking. In Chelmsley Wood off road parking is available in the town centre and in the residential areas.

### *Birmingham International Station/National Exhibition Centre (NEC)/Birmingham Airport*

- 5.26.63 In the NEC area, Southway, part of Eastway, Northway, Bickenhill Parkway, Clock Island and the A45 slip roads are clearways. Bickenhill Lane, Airport Way and the Station Link Road have No Waiting at any time restrictions. The Station Link Road also includes a section with Limited Waiting.
- 5.26.64 Coleshill Heath Road has Limited Waiting restrictions along its southern length from the roundabout with Bickenhill Road/Blackfirs Lane to the junction with Bickenhill Parkway.
- 5.26.65 There is a considerable amount of off-street car parking provided on a paid for basis at Birmingham International Station, Birmingham Airport and the NEC (including the NEC West Car Park).

### *Chelmsley Wood*

- 5.26.66 In the Chelmsley Wood area, the A452 is a clearway and there are small pockets of No Waiting at any time restrictions located around junctions on Yorkminster Drive and Chelmsley Road.
- 5.26.67 Off-road public car parking is available throughout the Chelmsley Wood local centre and on-street parking is also available within the residential areas in particular.

## Public transport

- 5.26.68 The area immediately to the west of the proposed Birmingham Interchange station is well served by public transport, with rail (via Birmingham International Station), bus and coach connections serving Birmingham Airport, the NEC, local businesses and offices. The Chelmsley Wood area is also well served by local rail (via Marston Green station) and local bus services. The rural areas along the line of the proposed route are less well served by public transport, although there are buses that pass through.
- 5.26.69 The following sections describe the rail, bus and coach services in the Birmingham Interchange and Chelmsley Wood CFA.

### *Rail network*

- 5.26.70 The rail network is shown on Figure 5-75. The key railway station in the Birmingham Interchange and Chelmsley Wood CFA is Birmingham International Station, which is located west of the Birmingham Interchange site in Solihull and near to junction 6 of the M42. It is one of the principal rail stations on the West Coast Main Line and provides access to national and local rail services.
- 5.26.71 Birmingham International Station served 4,444,278 passengers in 2010/11 (ORR station usage data). It also handled 54,261 interchange passengers and mainly deals with passengers starting or finishing their journeys at the station, due to its proximity to Birmingham Airport and the NEC. Baseline demand, in terms of PLANET modelling, identifies an existing level of 5,708 passengers at Birmingham International Station for long distance rail services per day in 2012, i.e. between 06:00-22:00.
- 5.26.72 Table 5-176 below summarises the major destinations served by Birmingham International station and the typical frequencies for these destinations.

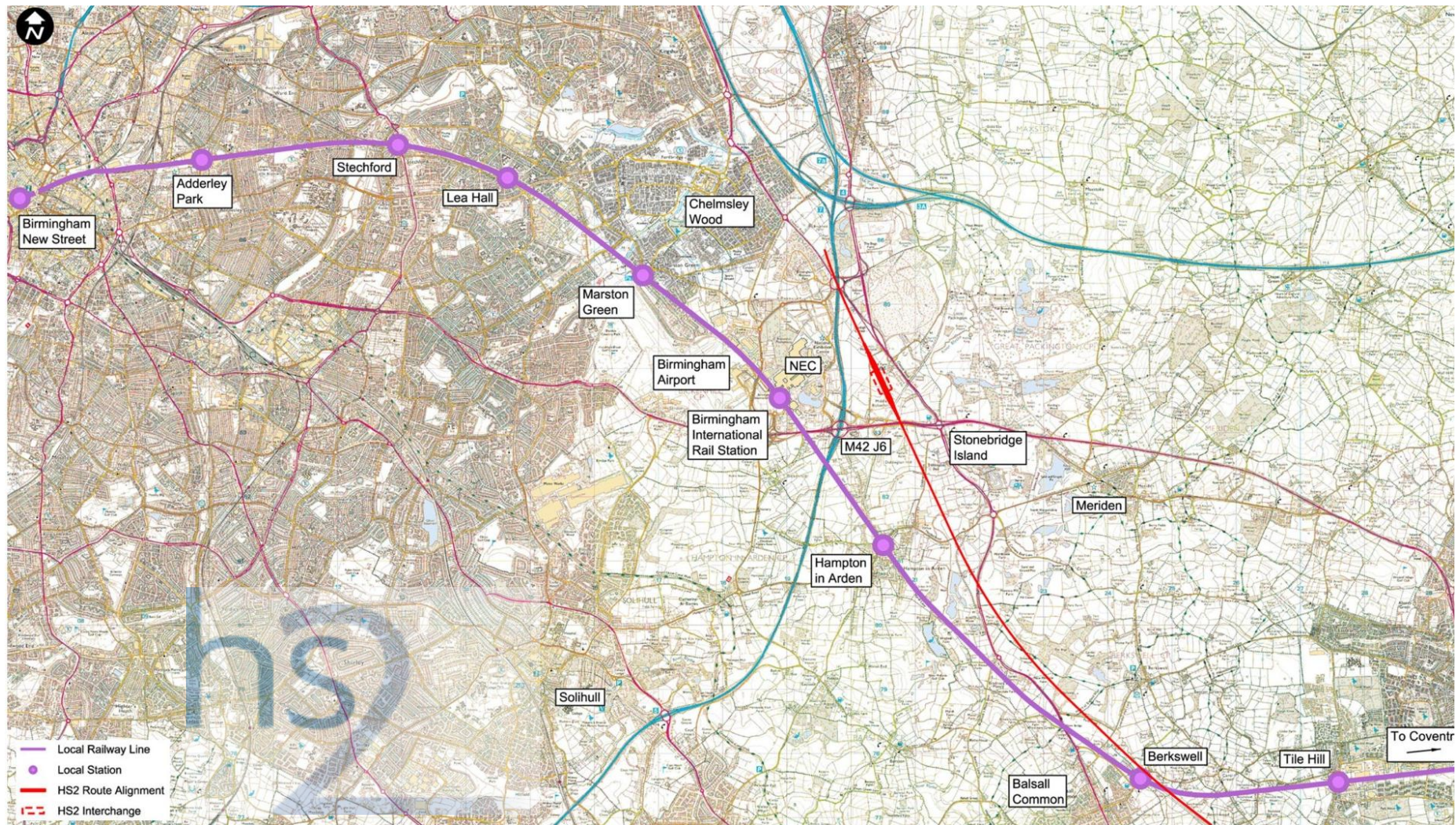
Table 5-176: Summary of major destinations directly accessible from Birmingham International Station (most frequently served)

Destination	Frequency
Birmingham	9 trains per hour
Coventry	7 trains per hour
London Euston	3 trains per hour
Milton Keynes	2 trains per hour
Northampton	2 trains per hour
Rugby	3 trains per hour
Wolverhampton	3 trains per hour

- 5.26.73 Birmingham International and Marston Green stations provide access to local rail services. There are up to three trains per hour in each direction serving Hampton-in-Arden, Berkswell, Tile Hill, Canley and Coventry stations and Lea Hall, Stechford and Birmingham New Street stations.



Figure 5-75; Birmingham Interchange and Chelmsley Wood - rail network





### Local bus services

- 5.26.74 The local bus network is shown on Figure 5-76 below.
- 5.26.75 There is a wide range of bus and coach service provision in the study area, comprising local buses and national coach services. However, the spread of coverage across urban and rural areas means that some areas have relatively low levels of provision in terms of frequency or times of day/week when services operate.

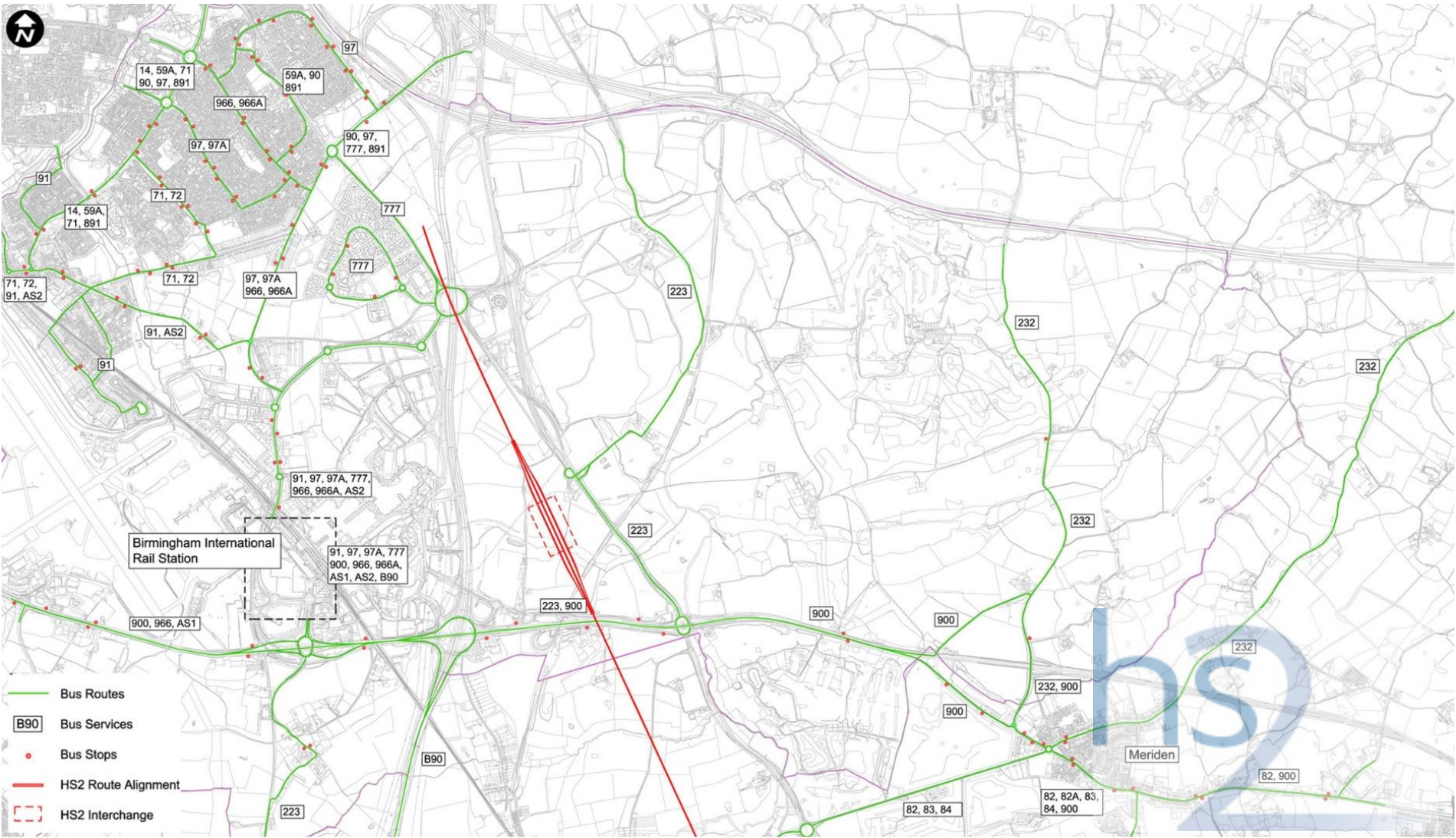
### Middle Bickenhill

- 5.26.76 As of September 2013 there is 1 bus services that passes through the Middle Bickenhill area. This bus route provides a total of 2 buses on a weekday, 0 buses on a Saturday and 0 buses on a Sunday. The bus services provide connections to Solihull, Coventry, Meriden, Coleshill and Birmingham Airport. The buses are routed along the following roads:
- A45;
  - A452; and,
  - Packington Lane.
- 5.26.77 Table 5-177 summarises the bus services within the Middle Bickenhill area.

Table 5-177: Bus routes and frequencies – Middle Bickenhill area

Bus Service	Route	No. of Buses (One-Way)				
		Weekday			Saturday (All Day)	Sunday (All Day)
		AM Peak Hour	PM Peak Hour	Total All Day		
223	Solihull – Kingsbury via Coleshill /Water Orton	0	0	1	0	0
	Kingsbury – Solihull via Coleshill /Water Orton	0	0	1	0	0
Total		0	0	2	0	0

Figure 5-76: Bus routes that serve Birmingham Interchange and Chelmsley Wood CFA Study Area



### Elmdon (Birmingham Airport/Birmingham International Station/NEC)

5.26.78 As of September 2013 there are 9 bus routes that serve Birmingham Airport, Birmingham International Station and the NEC (via the Interchange at the station). These bus routes provide a total of 472 buses on a weekday, 435 buses on a Saturday and 294 buses on a Sunday. The bus services provide connections to Coventry, Birmingham, Solihull, Chelmsley Wood, Marston Green, Erdington, Birmingham Business Park and Blythe Valley Business Park.

5.26.79 The following roads are bus routes:

- Bickenhill Lane;
- Station Link Road;
- Bickenhill Parkway;
- Coleshill Heath Road; and
- A446/A452 (5-arm roundabout)

5.26.80 Table 5-178 summarises the bus services within the Elmdon area.

Table 5-178: Bus routes and frequencies – Elmdon (Birmingham Airport, Birmingham International Station /NEC)

Bus Service	Route	No. of Buses (One-Way)				
		Weekday			Saturday (All Day)	Sunday (All Day)
		AM Peak Hour	PM Peak Hour	Total All Day		
91	International Station – Chelmsley Wood via Marston Green	0	0	5	5	0
	Chelmsley Wood – International Station via Marston Green	0	0	5	5	0
97A	Birmingham – Birmingham Airport	2	2	43	42	42
	Birmingham Airport – Birmingham	2	2	42	42	42
777	Hams Hall – Bham International	2	2	24	20	0
	Bham International – Hams Hall	2	2	24	20	0
900	Bham – Coventry via Airport / Meriden	4	4	61	60	65

Bus Service	Route	No. of Buses (One-Way)				
		Weekday			Saturday (All Day)	Sunday (All Day)
		AM Peak Hour	PM Peak Hour	Total All Day		
	Coventry – Bham via Airport / Meriden	4	4	66	62	34
966	Solihull – Erdington	2	2	30	30	10
	Erdington – Solihull	2	2	34	33	
966A	Erdington – Solihull Station via Bham Airport	0	0	0	0	5
	Solihull Station – Erdington via Bham Airport	0	0	0	0	0
AS1	Airparks Car Park – Bham Airport	0	0	30	30	30
	Bham Airport – Airparks Car Park	0	0	30	30	30
AS2	Airparks Car Park – Bham Airport	3	2	28	28	28
	Bham Airport – Airparks Car Park	2	3	28	28	28
B90	Bham Int'l Station – Blythe Valley Business Park	1	1	11	0	0
	Blythe Valley Business Park – Bham Int'l	1	1	11	0	0
Total		27	27	472	435	294

### Chelmsley Wood

5.26.81 As of September 2013 there are 9 bus services that serve the southern area of Chelmsley Wood. These bus routes provide a total of 878 buses on a weekday, 781 buses on a Saturday and 322 buses on a Sunday. The bus services provide connections Coventry, Birmingham, Solihull, Marston Green, Erdington and Birmingham International Airport.

5.26.82 The following roads are bus routes:

- Coleshill Heath Road;
- Yorkminster Drive;
- Dunster Road;

- Chelmsley Road
- Greenlands Road
- Helmswood Drive; and
- Moorend Avenue.

5.26.83 Table 5-179 summarises the bus services within the Chelmsley Wood area.

Table 5-179: Bus routes and frequencies – Chelmsley Wood

Bus Service	Route	No. of Buses (One-Way)				
		Weekday			Saturday (All Day)	Sunday (All Day)
		AM Peak Hour	PM Peak Hour	Total All Day		
14	Birmingham – Chelmsley Wood	6	7	105	105	52
	Chelmsley Wood – Birmingham	7	6	103	104	51
59A	Chelmsley Wood – Bham via Marston Green	0	0	2	2	0
71	Solihull – Sutton Coldfield /Chelmsley Wood	10	11	126	94	12
	Sutton Coldfield /Chelmsley Wood – Solihull	9	6	121	89	11
72	Bham – Solihull via Chelmsley	2	2	43	38	24
	Solihull – Bham via Chelmsley	3	3	40	39	23
90	Bham – Chelmsley Wood via Coleshill	2	3	31	28	14
	Chelmsley Wood – Bham via Coleshill	3	2	31	28	14
91	International Station – Chelmsley Wood	0	0	5	5	0
	Chelmsley Wood – International Station	0	0	5	5	0

Bus Service	Route	No. of Buses (One-Way)				
		Weekday			Saturday (All Day)	Sunday (All Day)
		AM Peak Hour	PM Peak Hour	Total All Day		
97	Birmingham – Chelmsley Wood via Meadway	4	6	105	90	49
	Chelmsley Wood – Birmingham via Meadway	8	6	97	91	46
966	Erdington – Solihull Station via Airport	2	2	29	29	11
	Solihull Station – Erdington via Airport	2	2	35	34	10
966A		0	0	0	0	5
Total		58	56	878	781	322

### *Coach services*

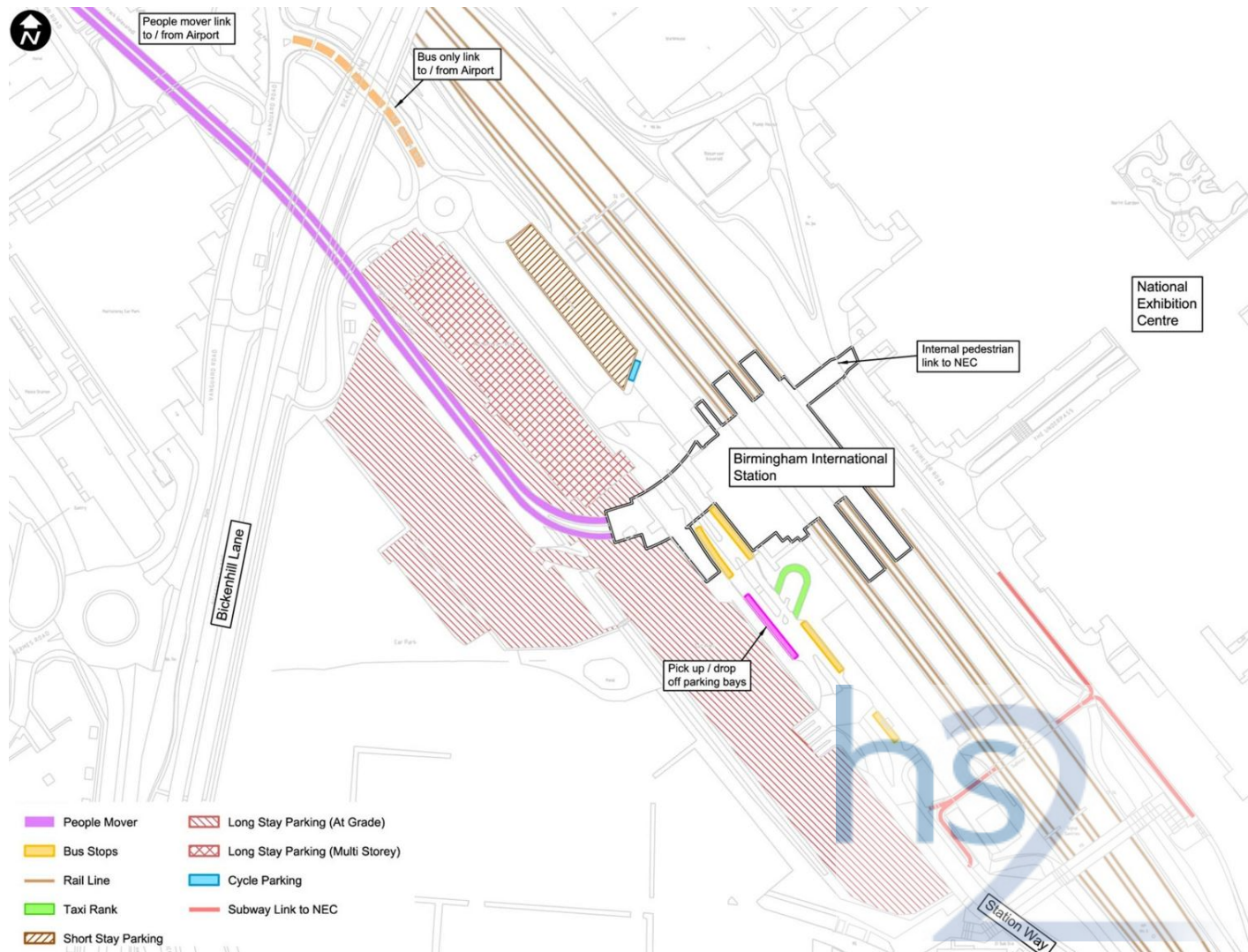
- 5.26.84 There are several long distance coach services that connect with Birmingham International Airport. These services are operated by National Express and Megabus.
- 5.26.85 Key destinations include Coventry, Gatwick Airport, Heathrow Airport, Leeds, Manchester, Milton Keynes, Poole, Southampton, Stansted Airport and Wolverhampton.

### *Public transport interchanges*

- 5.26.86 Birmingham International Station provides a multi-modal interchange for Birmingham Airport, the NEC, nearby offices and commercial premises. The interchange is located on the West Coast Main Line between the airport, which is accessible via the Air-Rail Link people mover system and the NEC, which is accessible via a dedicated, enclosed pedestrian link over the railway line.
- 5.26.87 The station provides national and local rail services, including links to London, Northampton, Milton Keynes, Oxford, Reading, Birmingham, Coventry and Wolverhampton.
- 5.26.88 The interchange is served by bus routes providing access to Birmingham, Coventry, Solihull, Chelmsley Wood, Coleshill, Marston Green, Meriden, Erdington, Birmingham Business Park, Blythe Valley Business Park and Hams Hall.
- 5.26.89 The Birmingham International Station facilities are shown on Figure 5-77 below.



Figure 5-77: Birmingham International Station and interchange



- 5.26.90 There is a dedicated bus only link between the station and the airport, which is used by four of the bus services. National coach services can be accessed at the airport, via the Air-Rail Link. These services provide a link to a number of cities and other airports including Heathrow, Gatwick and Manchester.
- 5.26.91 The Air-Rail Link provides a convenient regular connection between the station and the airport. The service is provided free of charge.
- 5.26.92 The station includes a taxi rank and short stay parking for private car drop off and pick up and has a long stay car park with 2,225 spaces.

### **Pedestrians, Cyclists and Equestrians**

- 5.26.93 The pedestrian and cycle network is shown on Figure 5-78 below
- 5.26.94 Dedicated pedestrian and cycle facilities in the Middle Bickenhill area are limited due to the rural nature of the area and the surrounding strategic road network. In the area around Birmingham Airport, Birmingham International Station and the NEC, pedestrian and cycle facilities are provided to facilitate access between the transport hubs and the local businesses. Chelmsley Wood is well served by pedestrian and cycle facilities, as is typical of an urban area.
- 5.26.95 The following sections identify the pedestrian and cycle facilities in the study area.

#### *Pedestrian facilities*

##### **Middle Bickenhill**

- 5.26.96 Eastway has a footway/cycleway on its north side from the point where traffic from the A45 westbound carriageway joins, to the bus/cycle lane on approach to the Toby Carvery. There is a disused section of footway/cycleway between Middle Bickenhill Lane and Eastway.
- 5.26.97 Middle Bickenhill Lane has a footway at its southern end between the disused footway/cycleway and Eastway. To the north, Middle Bickenhill Lane has no footways.
- 5.26.98 At the 5-arm roundabout of the A446, A452, Bickenhill Parkway and Solihull Parkway, there is a footway on each junction arm and these are connected with sections of footway on the roundabout gyratory.
- 5.26.99 The footway on the A446 is on the entry approach and extends back for approximately 130m where it connects to a private road providing access to a group of six offices.
- 5.26.100 The footway on the A452 (south) is on the entry approach and extends approximately 370m before terminating at the Greyhound Orphanage.

- 5.26.101 The footway on the north side of Bickenhill Parkway provides access to commercial units/trading estates and via footways on Bickenhill Road connects to Birmingham International Rail Station, the NEC and Birmingham Airport. The footway on Solihull Parkway provides access to Birmingham Business Park and connects with an off road cycle route on Blackfirs Lane.

### **Elmdon (Birmingham Airport/Birmingham International Station/NEC)**

- 5.26.102 There are footways on Bickenhill Lane, Airport Way and the Station Link Road providing access to Birmingham International Station, Birmingham Airport and the NEC. There is a subway between the Station Link Road and the NEC, along with a pedestrian link from within the station to the NEC. There is an off road footway/cycleway link between the station and the airport, which also provides a connection to Bickenhill Lane.

### **Chelmsley Wood**

- 5.26.103 Chelmsley wood has extensive footways which is typical of an urban area. In addition, there is a PRoW known as Green Lane, on the east side of Chelmsley Wood, which crosses the Proposed Scheme. Green Lane connects the A452 Chester Road with the B4114 Birmingham Road and the A446. The path passes under the M6 via a subway and bridges the M42.

### *Non-motorised User Flows*

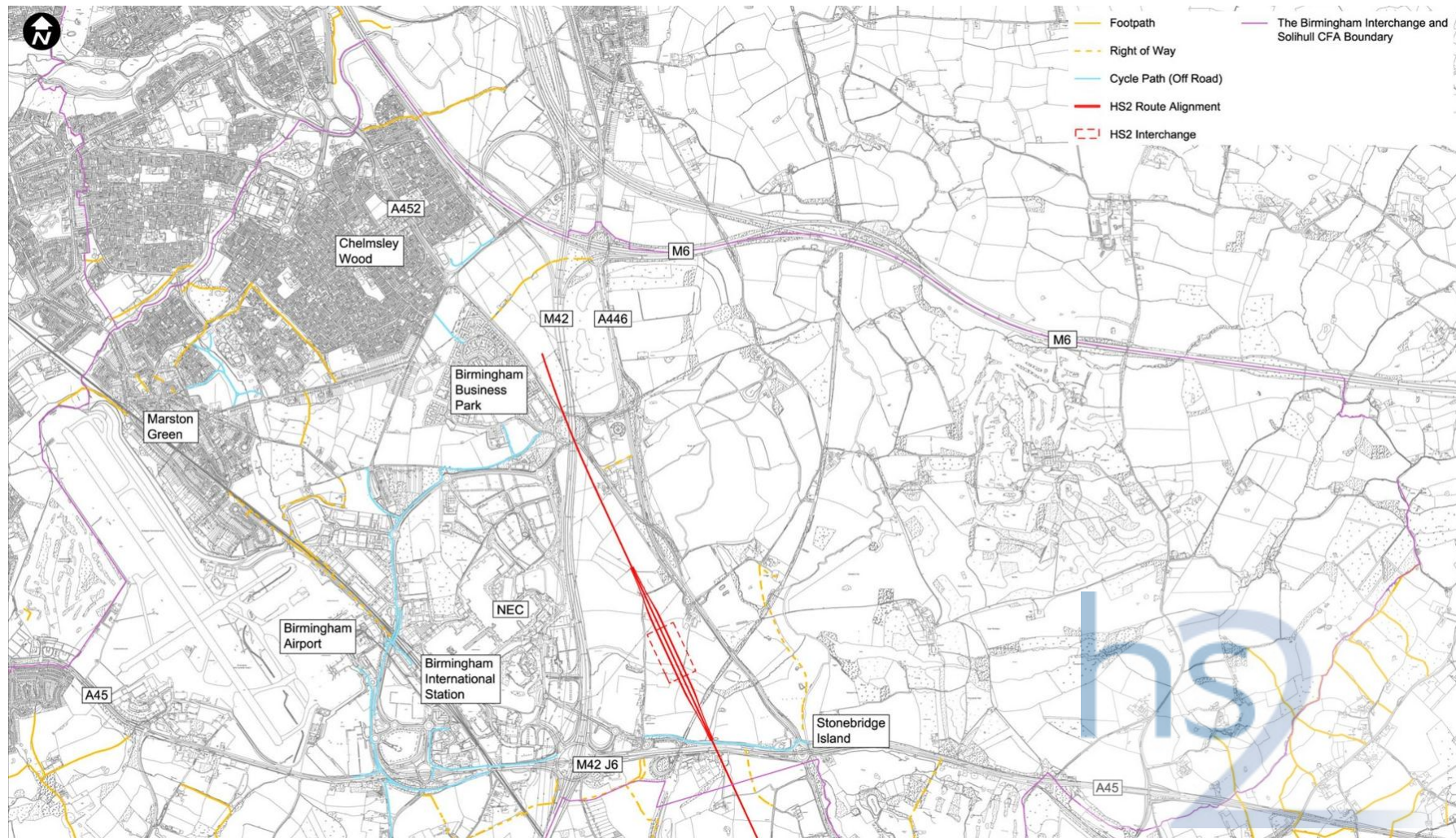
- 5.26.104 Table 5-180 below lists the survey locations/routes where use by pedestrians, cyclists and horses exceeded 20 per day.

Table 5-180: Non-motorised user survey locations

Description of Location	Max Number of Daily Users
Packington Lane	23
B4438 Bickenhill Parkway	54
Birmingham Business Park Access	101
A452/A446 Roundabout	41
A452	38
Coleshill Heath Road	55
Yorkminster Drive	87



Figure 5-78: Pedestrian and cycle facilities in the Birmingham interchange and Chelmsley Wood CFA study area



- 5.26.105 In total, 17 usage surveys were undertaken in August and September in the Birmingham Interchange and Chelmsley Wood CFA. Ten of the routes were used by less than 20 people in the 10 hour survey period. The routes with the greatest usage in the Birmingham Interchange and Chelmsley Wood CFA were Yorkminster Drive with 87 users. All the routes provide local access.
- 5.26.106 Eleven routes were surveyed in September in the Birmingham Interchange and Chelmsley Wood CFA. Seven of the routes were used by less than 20 people in the 12 hour survey period. The routes with the greatest usage in the Birmingham Interchange and Chelmsley Wood CFA were the Birmingham Business Park access with 101 users and the B4438 Bickenhill Parkway with 54 users. All routes provide local access.

### *Cycle facilities*

#### **Middle Bickenhill**

- 5.26.107 In addition to the off road footpath/cycle path along Eastway and Blackfirs Lane (see above), there are several advisory cycle routes in the Middle Bickenhill area. These include the following roads:

- Eastway between the Coventry Road and Pendigo Way;
- Middle Bickenhill Lane;
- Packington Lane;
- Solihull Parkway; and
- The Crescent.

#### **Birmingham International Station/National Exhibition Centre (NEC)/Birmingham Airport**

- 5.26.108 Within the NEC, Pendigo Way, which runs to the south of Pendigo Lake, is identified as an advisory cycle route, connecting to the Station Link Road via a subway and the airport. The airport roads around the terminal buildings are also advisory cycle routes.

#### **Chelmsley Wood**

- 5.26.109 There are off road cycle paths in the following locations:
- Between The Crescent in Birmingham Business Park and Coleshill Heath Road;
  - On Coleshill Heath Road between Chelmsley Road and the A452 Chester Road; and
  - On Coleshill Heath Road between the A452 Chester Road and Yorkminster Drive.
  - There is a network of advisory cycle routes in Chelmsley Wood and these include the following roads:

- Coleshill Heath Road, between Yorkminster Drive and the A446 Kenilworth Road;
- Chelmsley Road, between Coleshill Heath Road and Yorkminster Drive;
- Yorkminster Drive; and
- Ryeclose Croft/Partridge Close, which connects into the PRow known as Green Lane. Green Lane is identified as an off road cycle path.

### *Equestrian facilities*

- 5.26.110 There is one bridleway in the local area and this is shown on Figure 5-78
- 5.26.111 The bridleway is located north of Balsall Common and east of Hampton in Arden. Its west end is accessed off the A452 Kenilworth Road opposite Marsh Lane and the eastern end is accessed off Mercote Hall Lane. The bridleway has a bound surface and provides access to Mercote Mill Farm.

### **Waterways/canals**

- 5.26.112 There are no navigable waterways or canals in the local area.

### **Air transport**

- 5.26.113 Birmingham Airport is located to the west of the M42 and West Coast Main Line. It is the seventh biggest airport in the UK and the second busiest regional airport in the England, with an annual passenger throughput of 8.92 million passengers in 2012 (and 8.67 million passengers in 2011).
- 5.26.114 The main highway access route to the passenger terminal site is via junction 6 of the M42, the A45 and dedicated inbound/outbound access roads, with access also available via the Clock Island, Bickenhill Lane and Airport Way. On site infrastructure includes an internal road system for traffic to circulate into and out of the passenger terminal site, pick-up/drop-off areas, bus stops for local services and for National Express and Megabus coach services, taxi pick-up areas, and short, medium, long term and employee car parking. The Airport has in the order of 13,000 car parking spaces, including some 1,600 employee spaces.
- 5.26.115 Passengers and employees principally access the Airport by private vehicle. The Civil Aviation Authority Passenger Survey Report for 2011 (the latest year for which such airport passenger information is currently available) states that 79.2% of passengers accessed the airport by private transport, with 19.8% by public transport and 1.0% by 'other' modes.

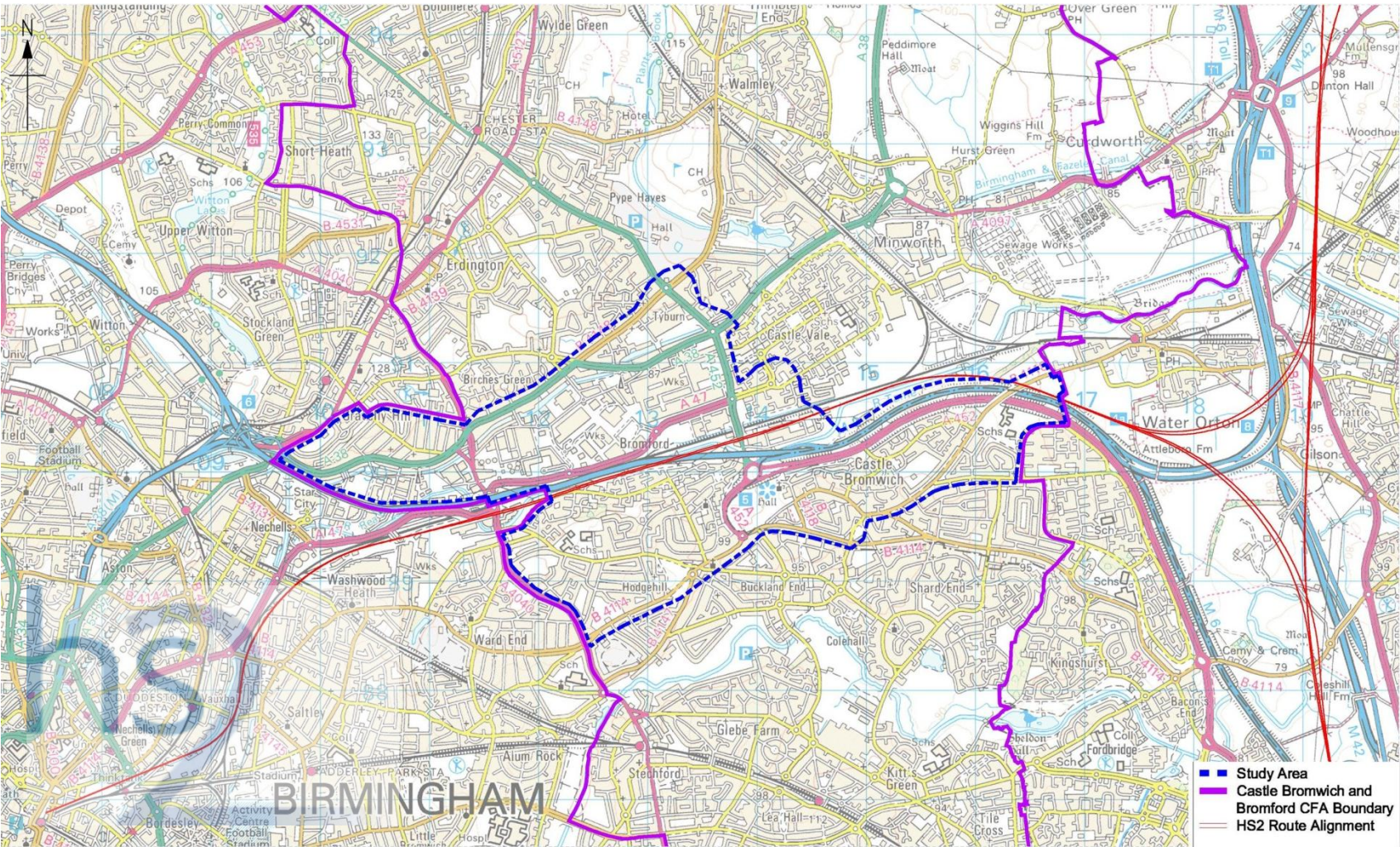


## **5.27 Castle Bromwich and Bromford (CFA25)**

### **Study Area**

- 5.27.2 This section provides an overview of the baseline traffic and transport conditions for the section of the Proposed Scheme that passes through the Castle Bromwich and Bromford CFA.
- 5.27.3 It describes the transport infrastructure within the Castle Bromwich and Bromford CFA which will be affected, either during the construction or operation of the Proposed Scheme. The baseline conditions relate to the transport network affected by construction and operation of the Proposed Scheme. The construction of the Proposed Scheme will include the replacement of the B4118 Water Orton Road bridge over the M6, A452 and the Proposed Scheme; the construction of the Bromford Tunnel; and the construction of the proposed Washwood Heath Depot. The operation of the Proposed Scheme will affect the local transport networks in the vicinity of the Washwood Heath Depot (which is located in the adjacent Washwood Heath to Curzon Street CFA).
- 5.27.4 The scope of work and study area has been discussed with the key transport authorities including Birmingham CC, Centro, the HA and NR.
- 5.27.5 The location of the key transport infrastructure can be found in Figure 2, Volume 2 (CFA25 Report) with Figure 5-79 below outlining the core study area for the Castle Bromwich and Bromford CFA, which includes parts of the M6 motorway, the A47 Heartlands Parkway and A4040 Bromford Lane, with the boundaries for the area including Sutton Coldfield to the north, Castle Vale and Castle Bromwich to the east, Washwood Heath Road, the River Cole, Bradford Road and Chester Road to the south and the A47 Heartlands Parkway to the west.
- 5.27.6 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from east to west along the proposed route.

Figure 5-79: Castle Bromwich and Bromford CFA study area





## Local land uses

- 5.27.7 In the Castle Bromwich and Bromford CFA, the Proposed Scheme will pass through predominantly urban areas of Birmingham that include extensive industrial and commercial activities. This includes the Castle Bromwich Business Park and Hayward Industrial Estate to the east of the area.
- 5.27.8 While the area is predominantly urban in character, the eastern end of the CFA lies on the rural fringe (see Volume 2: Maps CT-10-067 to CT-10-068a). The rural and open areas around the B4118 Birmingham Road and Park Hall nature reserve are located in this eastern section. The rest of the area is generally dominated by light industrial and commercial or infrastructure uses through Castle Vale, Castle Bromwich and Bromford. The industrial and commercial areas make use of lower lying land close to the River Tame and also the corridor of the main infrastructure (such as the Birmingham and Derby railway) that follows the valley. The main residential areas are generally on higher ground, away from the valley floor, although Bromford is situated close to the River Tame.
- 5.27.9 To the west of Bromford Lane, which forms the western boundary of the Castle Bromwich and Bromford CFA area, the Proposed Scheme will route through the site of the proposed Washwood Heath Depot. The site for the proposed depot is predominantly vacant brownfield land, although the north eastern part of the site is currently occupied by a mail distribution centre operated by UK Mail.

## Surveys

- 5.27.10 Traffic and non-motorised user were undertaken in June 2012 and June 2013 and the survey locations are shown in Annex B(v).

### *Traffic surveys*

- 5.27.11 The traffic surveys comprised:
- MCC and queue length surveys at highway junctions. Surveys were undertaken on a weekday between 07:00 and 10:00 and 16:00 and 19:00; and
  - ATC on highway links across the study area. Wherever possible, ATC data was gathered for a continuous two week period to coincide with the date of the MCCs.
- 5.27.12 The traffic survey data has been further supplemented by traffic data extracted from the HA's TRADS database which collects continuous data at various locations around the network.
- The traffic data showed that for the study area the weekday AM peak hour was 08:00-09:00 and the PM peak hour was 17:00-18:00.

### *Non-motorised user surveys*

- 5.27.13 Non-motorised user surveys were undertaken in August and September 2012 to establish the usage of PRoW, roadside footways and footpath links in the vicinity of the Proposed Scheme. The surveys included:
- all roads and associated footways intersected by the route of the Proposed Scheme; and
  - green corridors including footpaths, cycleways, bridleways, river and canal paths.
- 5.27.14 The August surveys were carried out between 08:00 and 18:00 on a weekend to capture leisure users. The September surveys were undertaken between 07:00 and 19:00 on a weekday to capture school and commuting users. September surveys were carried out on the routes that were identified as having a school or commuting use.

### **Highway network**

- 5.27.15 The following section describes the roads that would be affected by the Proposed Scheme, either during construction, or during operation. The area is well connected to the strategic road network with the M6, A38, A47 and A4040 all situated within the study area.

### *Strategic road network*

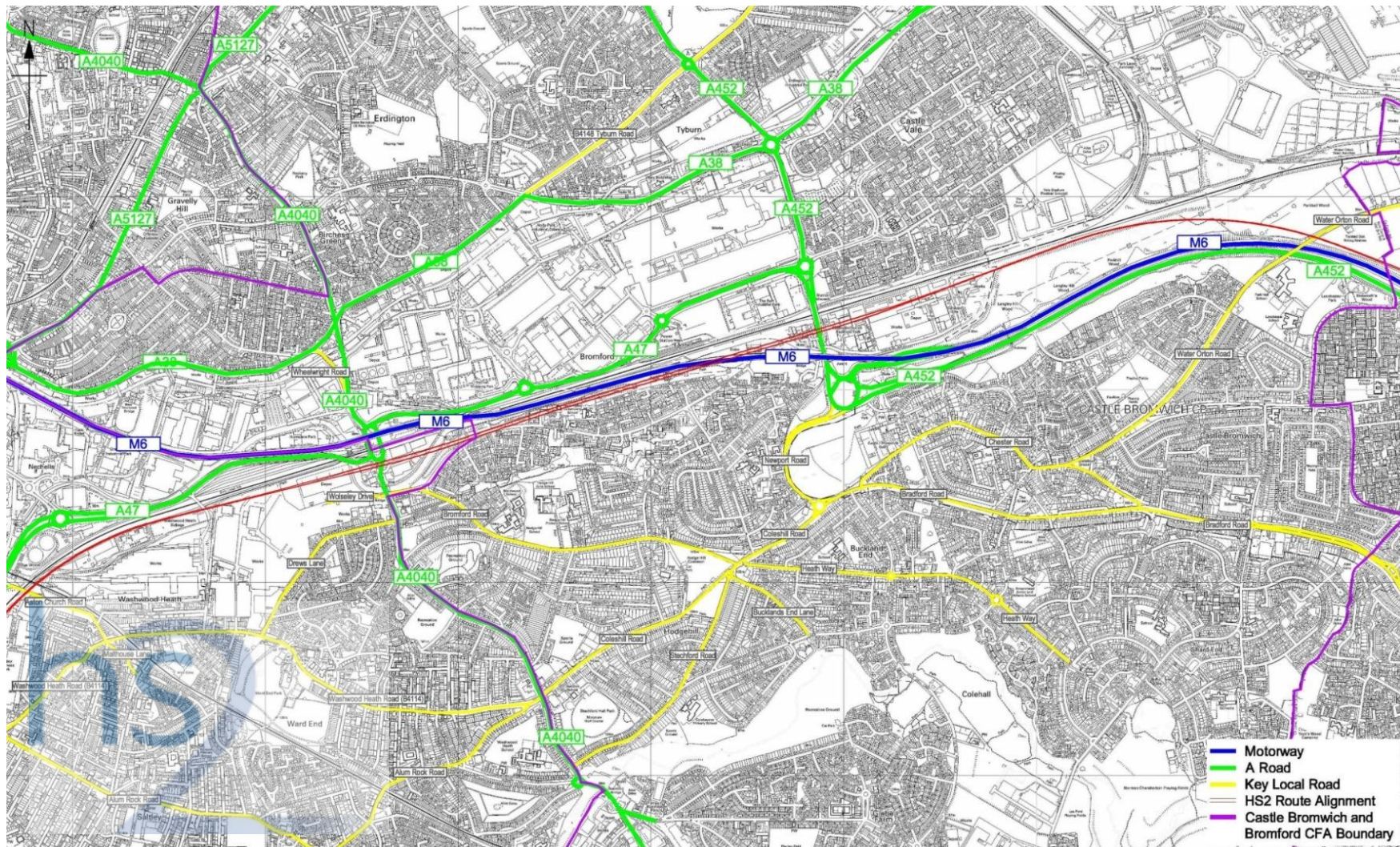
- 5.27.16 The strategic road network is shown on Figure 5-80.

### **Motorway network**

- 5.27.17 The M6 is a dual three-lane motorway which forms the northern section of the motorway 'box' around Birmingham. The M6 runs through the centre of the study area and is the primary motorway gateway into Birmingham City Centre for road traffic. It caters for longer distance movements from London, the South East and the North West and Yorkshire conurbations. More locally, it provides access to Birmingham from beyond the city, including traffic generated in the Midlands region such as Wolverhampton and Walsall to the north and Coventry and Warwickshire to the east.
- 5.27.18 Access to and from the M6 within the Castle Bromwich and Bromford area is provided at junction 5, which is a grade separated four-arm partially signalised roundabout. Junction 5 has east facing slip roads only and therefore only provides access to and from the M6 via a westbound off slip and eastbound on slip roads.
- 5.27.19 Junction 6 of the M6 is located approximately 5km west of junction 5, forming the primary gateway into Birmingham City Centre via the A38(M). It also provides access to other central and northern parts of Birmingham and beyond via the A38 and A5127.



Figure 5-80: Cattle Bromwich and Bromford strategic and local road network



## Primary 'A' roads

- 5.27.20 The A38 runs east to west along the northern boundary of the study area. The A38 is a cross city corridor, which links the northern suburbs of Birmingham and the residential and industrial areas of Tyburn, Bromford and Erdington with the centre of Birmingham, south west and beyond. Between junction 6 and the A4540 Dartmouth Circus (a distance of 3km), the road is designated as the A38(M) Aston Expressway, with a total of 7 lanes and has a tidal flow system. Its operation is managed by Birmingham CC and the speed limit is 50mph.
- 5.27.21 The A47 is a dual carriageway with a speed limit of 40mph. It passes for approximately 2km through the heart of the study area between Spitfire Island, at its junction with the A452 Chester Road (which is four-arm roundabout) and Bromford Island, at its junction with the A4040 Bromford Lane (which is a four-arm elongated signalised roundabout). The A47 continues east of Bromford Island, linking Castle Bromwich and Bromford with Birmingham City Centre.
- 5.27.22 The A4040 Bromford Lane runs from north to south through the western section of area. It connects Erdington (north) to Stechford and Ward End (south) and areas beyond. The A4040 forms part of the Birmingham Outer Ring Road. South of Bromford Island the speed limit is generally 30mph, whilst north of this junction it increases to 40mph.
- 5.27.23 The A4040 Bromford Lane/Bromford Road/Wolseley Drive junction, located 0.2km south of Bromford Island, provides access to the UK Mail site and other existing businesses located on Wolseley Drive. The junction is a four arm signalised junction and will form the part of the vehicular route to the proposed Washwood Heath Depot. The junction and the proposed depot are considered in more detail as part of the assessment of the Washwood Heath to Curzon Street CFA (CFA26).
- 5.27.24 The A452 is part of the region's primary route network. It connects Heartlands, Castle Vale and areas beyond to the northwest, with Kinghurst, Chelmsley Wood, Balsall Common and areas beyond to the south east. The A452 varies between a single carriageway road and a dual carriageway road, with speed limits varying between 30mph and 50mph within the Birmingham area.

## *Local road network*

- 5.27.25 The local road network is shown on Figure 5-80.



- 5.27.26 Bromford Road, Coleshill Road and Newport Road connect Bromford Lane with M6 junction 5 and, therefore, provide an alternative to using the A47 and Chester Road as a route to the M6. This is likely to be a route to and from the Washwood Heath Depot as Bromford Road forms the eastern arm of the Bromford Lane/Wolseley Drive junction, which will form the vehicular entrance to the depot. The route between Bromford Lane and the Motorway mainly passes through residential areas.
- 5.27.27 Bromford Road runs in an east-west direction and connects with Coleshill Road at a priority junction. Coleshill Road continues in a north easterly direction and connects with Newport Road at a three-arm roundabout. Bromford Road and Coleshill Road are two-way single carriageway roads that are subject to a 30mph speed limit. Newport Road is a two-way single carriageway road increasing to dual carriageway road as it approaches junction 5 of the M6. This road is subject to a 40mph speed limit.
- 5.27.28 East of Newport Road is the B4114 Bradford Road and the B4114/B4118/4119 Chester Road which comprise two-way single carriageway roads, with a speed limit of 30mph. These roads provide access to high density residential areas within Castle Bromwich.
- 5.27.29 The B4114/B4118/B4119 Chester Road also connects with the B4118 Water Orton Road, which runs east to west and connects the A446 and Water Orton to the east, with Castle Bromwich. To facilitate access between the east and west, a bridge is provided over the M6 and A452. The B4118 Water Orton Road is a two-way single carriageway two road with a 30mph speed limit.

### *Baseline conditions*

- 5.27.30 The assessment of the traffic flows in the Castle Bromwich and Bromford CFA shows that, typically, the peak hours are 0800 – 0900 in the AM and 1700 – 1800 in the PM.
- 5.27.31 The M6 (between junctions 5 and 6), A38, A47, A4040 and A452 form the main strategic access and/or egress routes for construction traffic and, during operation, for the Proposed Scheme. The existing peak hour flows for these links are summarised in Table 5-181 below.

Table 5-181: Castle Bromwich and Bromford strategic network 2012 baseline AM and PM peak traffic flows

Link	Direction	AM Peak		PM Peak	
		Vehicles	HGVs	Vehicles	HGVs
A452 Chester Road (north of B4148 Tyburn Road)	NB	876	75	1,254	59
	SB	1,185	96	980	55
A452 Chester Road (north of Spitfire Island)	NB	1,379	83	1,794	45
	SB	1,544	163	1,242	112
A452 Chester Road (south of Spitfire Island roundabout)	NB	2,166	265	1,943	182
	SB	1,814	242	1,615	147
A452 (east of M6 junction 5 Roundabout)	EB	700	72	733	42
	WB	887	77	756	60
A38 Kingsbury Road (east of Tyburn House Island)	EB	998	148	1,430	119
	WB	1,288	159	1,243	110
A38 Tyburn Road (west of Tyburn House Island)	EB	842	118	800	75
	WB	1,201	161	986	86
A38 Tyburn Road (west of Wheelwright Road)	EB	1,232	103	1,232	103
	WB	1,645	268	1,415	168
A4040 Bromford Lane (north of A38 Tyburn Road)	NB	629	48	1,092	50
	SB	841	52	560	33
A4040 Bromford Lane (north of Bromford Island)	NB	982	79	1,304	115
	SB	1,167	121	970	72
A4040 Bromford Lane (south of Drews Lane)	NB	907	63	918	33
	SB	868	52	918	27
A47 Fort Parkway (east of Bromford Island)	EB	637	103	715	39
	WB	1,035	105	874	69
M6 (east of junction 5)	EB	4,988	1550	6,022	1240
	WB	5,255	1,565	4,567	1034
M6 (west of junction 5)	EB	3,868	732	4,902	533
	WB	4,378	942	3,515	529
M6 junction 5 Onslip	EB	874	177	874	91
M6 junction 5 Offslip	WB	833	189	981	124

- 5.27.32 A number of local roads will also be impacted by the construction or operation of the Proposed Scheme and the existing flows on these routes are summarised in Table 5-182 below.

Table 5-182: Castle Bromwich and Bromford strategic network 2012 baseline local network traffic flows

Link	Direction	AM		PM	
		Total Vehicles	HGVs	Total Vehicles	HGVs
B4148 Tyburn Road	EB	337	27	604	16
	WB	978	56	410	29
Tangmere Drive	EB	331	15	467	11
	WB	570	17	332	17
Langley Drive	NB	45	6	12	3
	SB	28	6	37	3
Tameside Drive	NB	33	3	9	1
	SB	15	2	29	1
Newport Road	EB	169	13	35	6
	WB	76	10	118	8
B4118 Parkfield Drive	EB	1,105	68	1,138	26
	WB	943	60	1,044	48
Water Orton Road	NEB	182	9	162	7
	SWB	129	9	109	4
Bromford Road (east of A4040 Bromford Lane)	EB	515	8	524	8
	WB	539	13	536	13
Coleshill Road (east of Bromford Road)	NB	441	21	539	11
	SB	721	18	461	19
Coleshill Road (east of A4040 Bromford Lane)	EB	309	40	419	30
	WB	588	49	345	26

## Accidents and safety

- 5.27.33 Accident data was obtained from Birmingham CC for the three year period from July 2009 to June 2012.
- 5.27.34 A total of 130 PIA occurred over the three year period in the Castle Bromwich and Washwood Heath CFA, an average of 45 per year. The locations of the accidents are shown on Figure 5-81.

5.27.35 Of the 130 accidents, 83.9% were classified as slight, 14.6% involved a serious injury and 1.5% were fatal accidents. The highest number of accidents occurred at M6 junction 5 (24 accidents), the A38/A452 junction (16 accidents), A47/A4040 Bromford Lane (Bromford Island) (15 accidents) and the A4040 Bromford Lane/B4114 Washwood Heath Road junction (15 accidents).

5.27.36 Table 5-183 shows a summary of the accidents at the locations where there were clusters of accidents (nine or more, in the three year period).

Table 5-183: Summary of accidents in the Castle Bromwich and Bromford CFA study area

Location	Year			Severity			Total
	Yr 1	Yr 2	Yr 3	Fatal	Serious	Slight	
M6 junction 5/A452	10	11	3	1	1	22	24
A38/A452	7	5	4	0	1	15	16
A47/A4040 Bromford Lane	9	4	2	0	2	13	15
A4040 Bromford Lane/B4114 Washwood Heath Road	4	5	6	0	3	12	15
A38/A4040	3	2	6	0	3	8	11

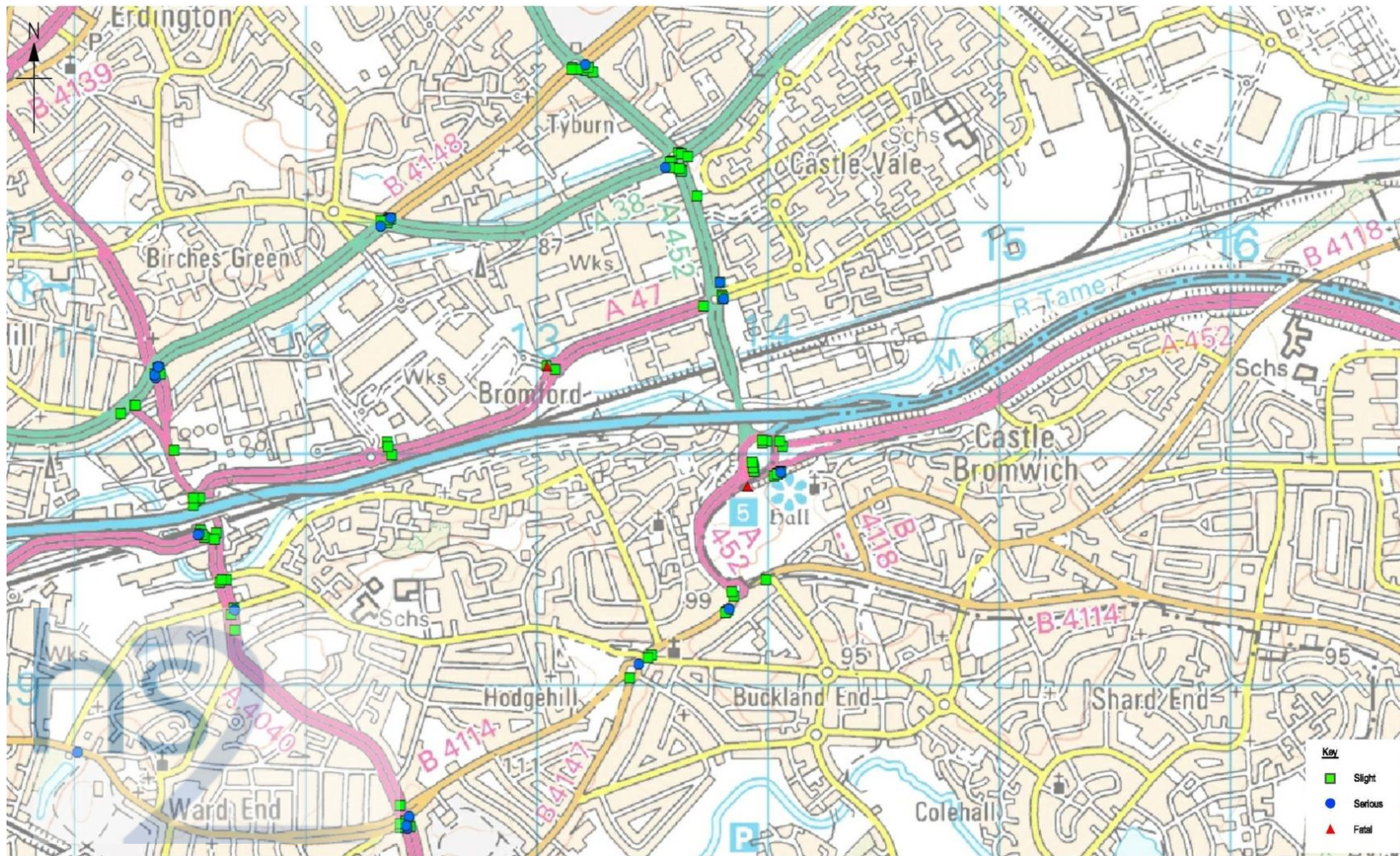
## Parking and loading

5.27.37 There are no significant areas of public parking in the Castle Bromwich and Bromford CFA. There are several large private car parks associated with major developments, including Castle Vale Shopping Centre, Fort Dunlop, The Fort Shopping Park and Ravenside Retail Park, but these will not be affected by the Proposed Scheme. However the proposed route will pass through the Castle Bromwich Business Park, where off-street private parking is provided for businesses.

5.27.38 Throughout the study area, there are many areas available for on-street parking. For example, Bromford Drive, Farnhurst Road and Fairholme Road currently have no parking restrictions. In contrast, there are sections of 'no waiting at any time' restrictions on Bromford Lane, the A47 and the A38.



Figure 5-81: Summary of accidents in the Castle Bromwich and Bromford CFA study area



## Public transport

- 5.27.39 The Castle Bromwich and Bromford CFA is well served by local bus services and there are also three railway stations located within the area. The following sections describe the rail, bus and coach services in the Castle Bromwich and Bromford CFA.

### *Rail network*

- 5.27.40 Birmingham City Centre is served by three major railway stations, New Street, Moor Street and Snow Hill. All three stations are located within the Washwood Heath to Curzon Street CFA and are discussed within the associated report.
- 5.27.41 The local rail network is shown on Figure 5-82
- 5.27.42 Stechford Station is the closest rail access for the Washwood Heath Depot within the Castle Bromwich and Bromford CFA. It lies at the junction between the Rugby to Birmingham railway and the Stechford and Aston railway. The station is served by two trains per hour in each direction, providing connections to New Street and Birmingham International stations. One train per hour provides connections between Stechford and London Euston.
- 5.27.43 Lee Hall Station is located approximately 1km south east of Stechford Station and is also on the Rugby to Birmingham railway.
- 5.27.44 Erdington Station is located approximately 3km to the north of the depot site and is on the Cross City line. Up to 12 trains depart this station per hour, serving New Street and locations such as Four Oaks and Lichfield (to the north) and Longbridge and Redditch (to the south).

### *Local bus services*

- 5.27.45 There is a wide range of bus services within the Castle Bromwich and Bromford CFA which will pass close to the proposed Washwood Heath Depot site and route of the scheme. The closest bus stop to the depot site within the Castle Bromwich and Bromford CFA is located on the A4040 Bromford Lane, 350m south east of the main gate at Wolseley Drive. This provides access to northbound buses, with the southbound bus stop a further 100m from the depot site.
- 5.27.46 Access to a variety of locations across Birmingham is possible from within the study area, as summarised by Figure 5-83. Further detail regarding the main bus routes through the area is provided below. All data presented was collated in September 2013.



Figure 5-82: Castle Bromwich and Bromford local rail network

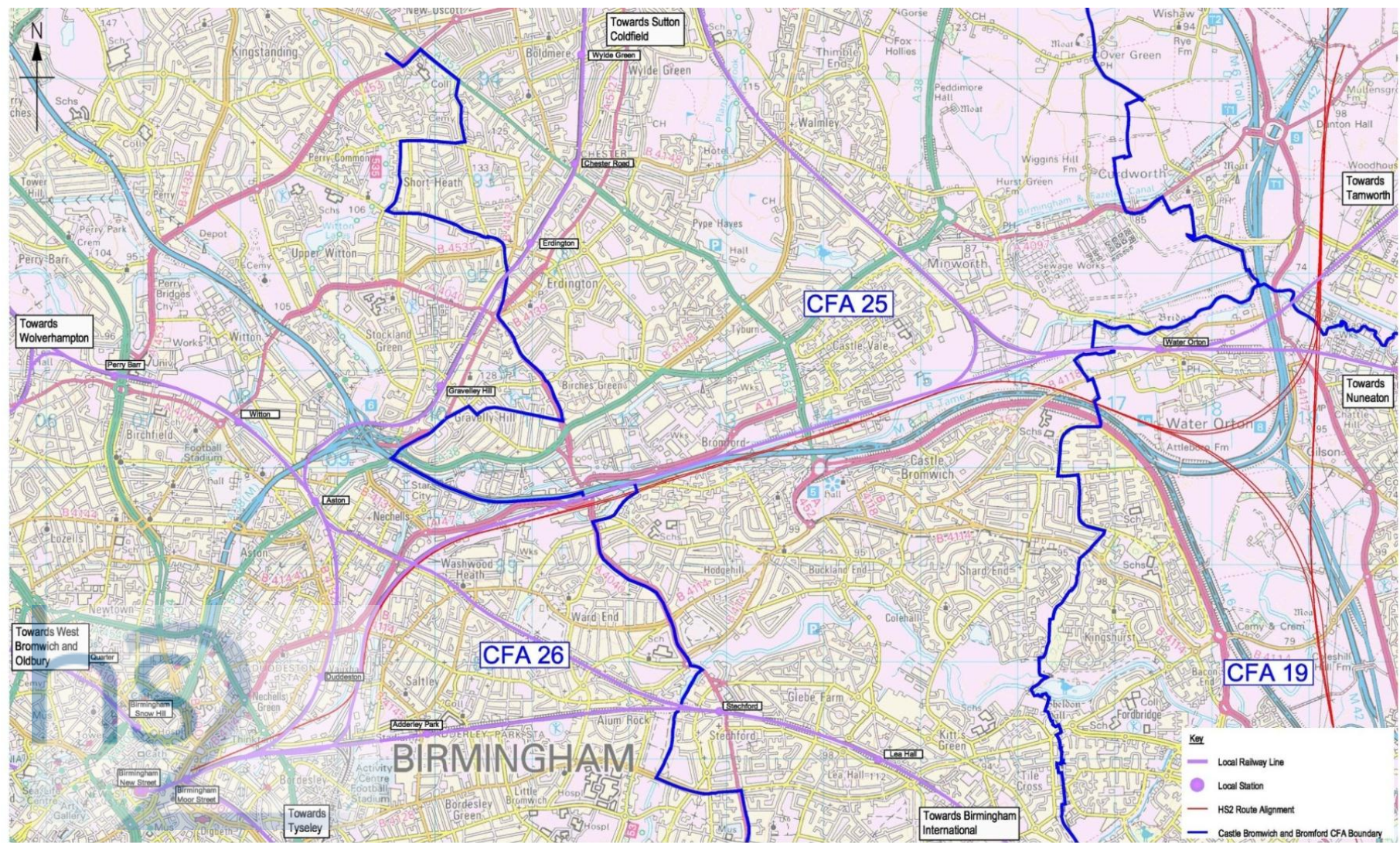
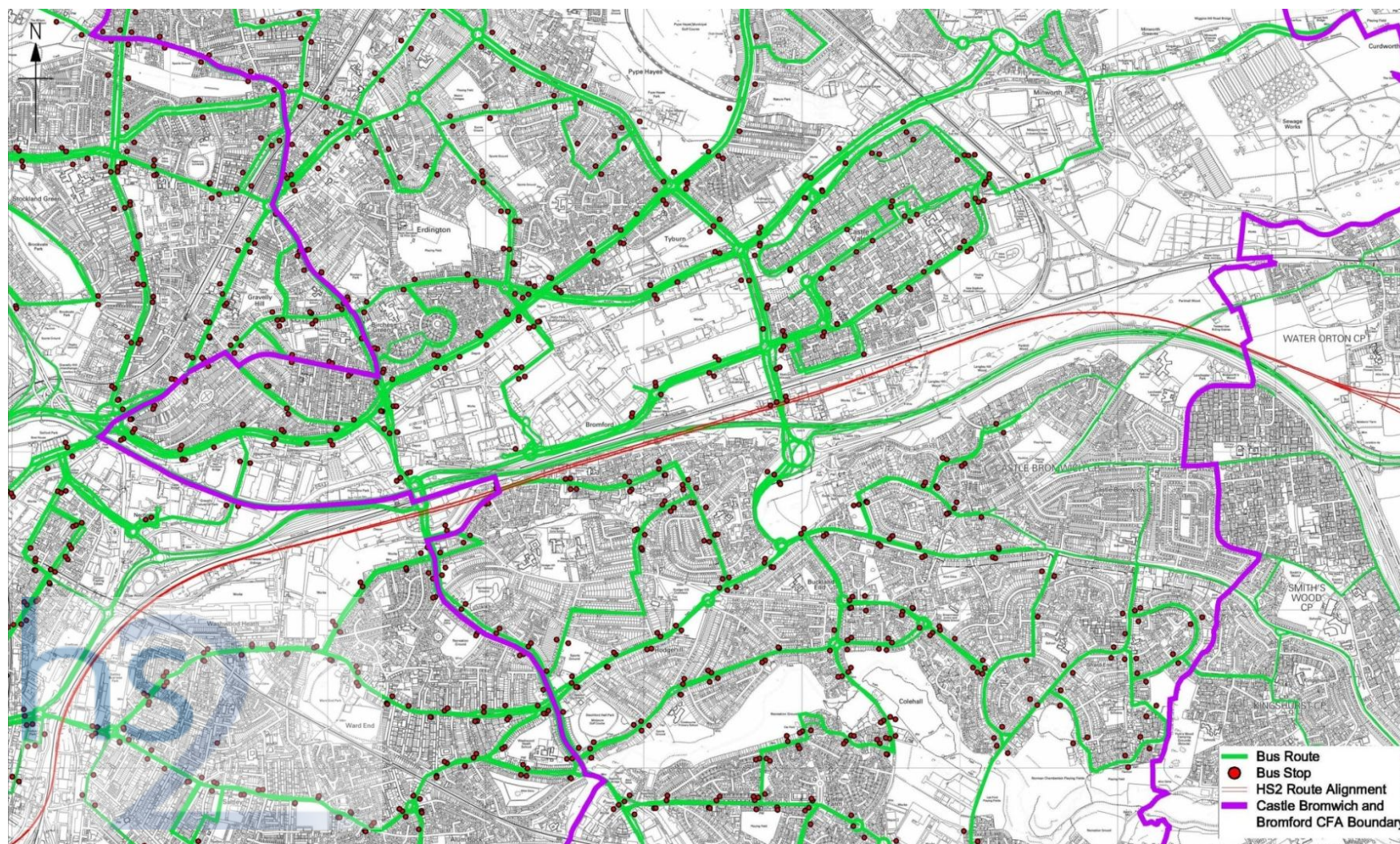




Figure 5-83: Bus routes that serve Castle Bromwich and Bromford CFA



*A452 Chester Road*

5.27.47 There are six bus services that pass along the A452 Chester Road, which provide a total of approximately 413 buses on a weekday, 330 buses on a Saturday and 150 buses on a Sunday. These bus services provide connections to Alum Rock, Chelmsley Wood, Erdington, Heartlands, Marston Green, Small Heath, Solihull, Sutton Coldfield and Birmingham International Station/Birmingham Airport.

5.27.48 The following roads are local bus routes:

- A38 Kingsbury Road;
- A38 Eachelhurst Road;
- Lichfield Road;
- Bradford Road;
- Tangmere Drive; and
- Coleshill Road.

*A47 Fort Parkway*

5.27.49 There is one bus service that passes and stops along the A47 Fort Parkway. This bus route provides a total of 61 buses on a weekday, 60 buses on a Saturday and 19 buses on a Sunday. These bus services provide connections to Buckland End, Chelmsley Wood, Erdington, Solihull and Birmingham International Station/Birmingham Airport. The buses are routed along the following roads:

- A47 Fort Parkway;
- A38 Tyburn Road;
- A452 Chester Road; and
- B4118 Chester Road and Water Orton Road.

*A4040 Bromford Lane*

5.27.50 There are seven bus services that pass along the A4040 Bromford Lane. These bus routes provide a total of approximately 348 buses on a weekday, 297 buses on a Saturday and 176 buses on a Sunday. These bus services provide connections to Birmingham City Centre, Acocks Green, Chelmsley Wood, Erdington, Handsworth, Saltley, Stechford and Solihull. The buses are routed along the following roads:

- A4040 Bromford Lane;
- Drews Lane;
- Bromford Drive;

- Coleshill Road;
- Bradford Road; and
- Packington Lane.

### Bus Routes

5.27.51 The bus services which currently serve the areas of the Castle Bromwich and Bromford CFA in the vicinity of the Proposed Scheme alignment, or that route along roads that may be affected by changes in vehicle movements either during construction or operation of the Proposed Scheme are summarised in Table 5-184 below.

Table 5-184: Bus Routes and frequencies in the Castle Bromwich and Bromford CFA study area

Bus Service	Route	No of buses (One Way)				
		Weekday			Saturday (All Day)	Sunday (All Day)
		AM Peak Hour	PM Peak Hour	Total All Day		
28	Great Barr – Small Heath	5	6	84	66	31
	Small Heath – Great Barr	5	6	84	66	31
28E	Small Heath – Old Oscott	0	0	0	0	32
	Old Oscott – Small Heath	0	0	0	0	32
71	Sutton Coldfield – Solihull	3	3	41	39	0
	Solihull – Sutton Coldfield	3	3	41	39	0
71	Solihull – Sutton Coldfield via Marston Green	0	0	9	9	12
	Sutton Coldfield – Solihull via Marston Green	0	0	9	9	12
966	Solihull – Erdington	2	1	30	30	9
	Erdington – Solihull	2	1	30	30	9
966	Erdington – Solihull Station via Airport	0	2	17	5	4
	Solihull Station – Erdington via Airport	0	2	17	5	4
966A	Erdington – Airport via Chelmsley Wood	0	0	0	0	5
	Airport – Erdington	0	0	0	0	5

Bus Service	Route	No of buses (One Way)				
		Weekday			Saturday (All Day)	Sunday (All Day)
		AM Peak Hour	PM Peak Hour	Total All Day		
	via Chelmsley Wood					
AH4*	Water Orton – King Edwards 6th School Handsworth	0	0	1	0	0
	King Edwards 6th School Handsworth – Water Orton	0	0	1	0	0
SP1*	St Pauls Girls School – Yardley, Swan Island	0	0	1	0	0
	Yardley, Swan Island – St Pauls Girls School	0	0	1	0	0
25	Fox & Goose – Erdington via Bromford Bridge	0	0	5	5	0
	Erdington – Fox & Goose via Bromford Bridge	0	0	5	5	0
72	Solihull – Birmingham via Chelmsley Wood	3	3	39	38	23
	Birmingham – Solihull via Chelmsley Wood	3	3	39	38	23
72	Clock Garage – Birmingham via Alum Rock	0	0	6	6	6
	Birmingham – Clock Garage via Alum Rock	0	0	6	6	6
90	Birmingham – Chelmsley Wood via Coleshill	3	3	35	32	14
	Chelmsley Wood – Birmingham via Coleshill	3	3	35	32	14
94	Birmingham – Chelmsley Wood via Ward End	4	4	56	30	0
	Chelmsley Wood – Birmingham via Ward End	4	4	56	30	0

Bus Service	Route	No of buses (One Way)				
		Weekday			Saturday (All Day)	Sunday (All Day)
		AM Peak Hour	PM Peak Hour	Total All Day		
94	Birmingham – Chelmsley Wood via Ward End	8	8	114	102	53
	Chelmsley Wood – Birmingham via Ward End	8	8	114	102	53
16	Tamworth – Ventura Park - Kingsbury	0	0	7	0	0
	Kingsbury – Ventura Park - Tamworth	0	0	7	0	0
55	Chelmsley Wood – Birmingham via Ward End	7	6	98	79	34
	Birmingham – Chelmsley Wood via Ward End	7	6	98	79	34
55A	Chelmsley Wood – Birmingham via Ward End	5	4	49	43	0
	Birmingham – Chelmsley Wood via Ward End	5	4	49	43	0
885*	Castle Bromwich – Saint Pauls R.C. School	0	0	1	0	0
	Saints Pauls R.C. School – Castle Bromwich	0	0	1	0	0
11C	Birmingham Outer Circle Clockwise	1	1	12	0	0
	Birmingham Outer Circle Anticlockwise	1	1	12	0	0
11C	Acocks Green – Acocks Green Village	8	7	117	96	61
	Acocks Green Village – Acocks Green	8	7	117	96	61
FW2*	Erdington – King Edwards (Five Ways) School	0	0	1	0	0
	King Edwards (Five Ways) School – Erdington	0	0	1	0	0



Bus Service	Route	No of buses (One Way)				
		Weekday			Saturday (All Day)	Sunday (All Day)
		AM Peak Hour	PM Peak Hour	Total All Day		
116	Birmingham – Tamworth via Kingsbury	0	1	11	11	0
	Tamworth – Birmingham via Kingsbury	0	1	11	11	0
67	Birmingham – Castle Vale	7	7	94	78	42
	Castle Vale – Birmingham	7	7	94	78	42
108	Birmingham – New Hall via Tyburn Road	0	2	6	0	0
	New Hall – Birmingham via Tyburn Road	0	2	6	0	0
168	Sutton Coldfield – Erdington via Walmley	1	0	7	7	0
	Erdington – Sutton Coldfield via Walmley	1	0	7	7	0
838A*	Erdington – Fairfax School via The Yenton	1	0	1	0	0
	Fairfax School – Erdington via The Yenton	0	1	1	0	0
839*	Pypes Hayes – Fairfax School via Walmley	1	0	1	0	0
	Fairfax School – Pypes Hayes via Walmley	0	1	1	0	0
914	Birmingham – Sutton Coldfield	2	2	31	30	29
	Sutton Coldfield – Birmingham	2	2	31	30	29
638	Erdington – Castle Vale	2	2	26	21	0
	Castle Vale – Erdington	2	2	26	21	0

\* School Bus

### *Coach services*

- 5.27.52 There are no long distance coach services in the Castle Bromwich and Bromford CFA. Long distance coach services are available at Birmingham Coach Station in Digbeth (to the west) or the Airport (to the south) and are considered in the assessment of the Washwood Heath to Curzon Street CFA and the Birmingham Interchange and Chelmsley Wood CFA respectively.

### *Public transport interchanges*

- 5.27.53 There are no major public transport interchanges within the Castle Bromwich and Bromford CFA.

### **Pedestrians, cyclists and equestrians**

- 5.27.54 Pedestrians, Cyclists and Equestrians. The following sections identify the pedestrian and cycle facilities in the study area. The pedestrian and cycle network is shown on Figure 5-84.

### *Pedestrian facilities*

- 5.27.55 The A4040 Bromford Lane bounds the site of the proposed Washwood Heath Depot to the west, with footways and street lighting provided on both sides of the road along this route. Signalised pedestrian crossings are provided at the major junctions, such as Bromford Island, Drews Lane/A4040 Bromford Lane and Washwood Heath Road/A4040 Bromford Lane. Dropped kerbs are provided at minor junctions, including the A4040 Bromford Lane/Wolseley Drive junction.
- 5.27.56 The provision of these crossings assists with the movement of pedestrians across the A4040 Bromford Lane, to and from the predominantly residential area of Hodge Hill and beyond to the south east and between the proposed depot site, the A38 and the residential areas beyond, including Gravelly Hill, Birches Green and Erdington.
- 5.27.57 The pedestrian facilities along the A47 provide pedestrian links to areas east of the Washwood Heath Depot site, for example, the areas of Bromford and Castle Vale. Footways are provided alongside both sides of the Tyburn Road (A38), on the section between Bromford Lane and the Gravelly Interchange. Extensive signalised pedestrian crossing facilities are provided both across the Tyburn Road (A38) and at major side road junctions, for example Jarvis Way and Wheelwright Road. Facilities are provided across the Tyburn Road (A38) close to the junction with Abbots Road and close to the junction with Walker Drive.

### *Non-motorised user flows*

- 5.27.58 Table 5-185 lists the survey locations/routes where use by pedestrians, cyclists and horses exceeded 20 per day.

Table 5-185: Castle Bromwich and Bromford non-motorised user survey results

Description of Location	Maximum Number of Daily Users
B4118 Water Orton Road	135
A452 Chester Road between the A47 Fort Parkway junction to the north and the Tameside Drive junction to the south – Pedestrian link over existing railway line	310
A47/A4040 Roundabout – Footway between A47 Heartlands Parkway and the A4040 Bromford Lane on the west side of the gyratory	126
A47/A4040 Roundabout – Footway between the A47 Fort Parkway and the A4040 Bromford Lane on the east side of the gyratory	142
Grass area between M6 and Bromford Drive (west of Warstone Tower)	313

5.27.59 In total, nine surveys were undertaken in August in the Castle Bromwich and Bromford CFA. Four of the routes were used by less than 20 people in the 10 hour period surveyed. The routes with the greatest usage were along the A452 Chester Road with 246 users, the footway between the A47 Fort Parkway and the A4040 Bromford Lane (east side of the gyratory) with 142 users and Water Orton Road with 135 users. All the routes provide local access.

5.27.60 Nine routes were surveyed in September across the study area. Six of the routes were used by less than 20 people in the 12 hour survey period. The routes with the greatest usage were the grass area between the M6 and Bromford Drive with 313 users, the A452 Chester Road with 310 users and the footway between the A47 Fort Parkway and the A4040 Bromford Lane (west side of the gyratory) with 126 users.

### *Cycle Facilities*

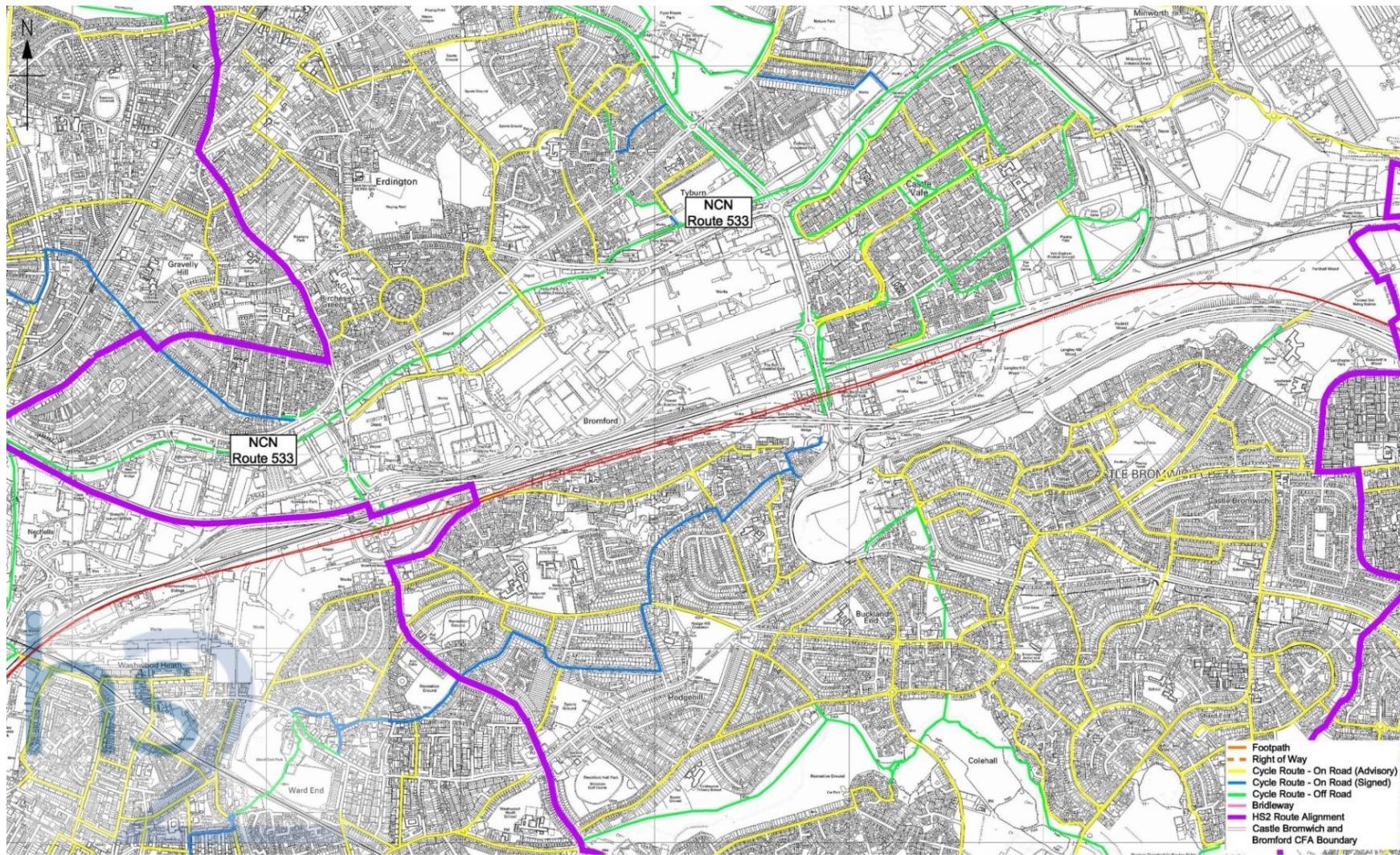
5.27.61 There is a traffic free cycle route around Bromford Island to assist cycle passage and safety through this busy junction. The route loops around the junction and facilitates connections to and from the north in the direction of National Cycle Network (NCN) Route 533.

5.27.62 NCN Route 533 passes through the study area, forming part of a regional route, which is predominantly traffic free. The route passes along the Birmingham Fazeley Canal towpath, close to the A38 Tyburn Road, from Tamworth in the north-east to Gravelly Interchange in the west, where it connects with NCN Route 535. NCN Route 535 links Digbeth and Birmingham City Centre with areas such as Kingstanding to the north of Birmingham.

5.27.63 NCN Route 534 runs from the Birmingham and Fazeley Canal to the north east of Castle Bromwich and Bromford CFA, near Minworth, passing along and then north of the B4148 Eachelhurst Road to Sutton Coldfield and Sutton Park. NCN Route 534 connects with the Fazeley Canal towpath.



Figure 5-84: Pedestrian and cycle facilities in the Castle Bromwich and Bromford CFA study area





- 5.27.64 Approximately 1km to the south of the proposed Washwood Heath Depot site, connections are available to the Ward End cycle route, which runs from Great Barr Street in Birmingham City Centre (south west) to west of Castle Bromwich in the north east, close to the A452 Chester Road, just north of the M6 junction 5 roundabout. At this location, it connects with other local routes, which provide traffic free paths through the Castle Vale area and afford passage for cyclists wishing to travel across or around the A452/A47 junction at Spitfire Island. The Ward End cycle route predominantly comprises an on road signed cycle route, although short sections of this route are traffic free.
- 5.27.65 There are also several advisory on road cycle routes in the Castle Bromwich and Bromford CFA area. These include:
- Bromford Road;
  - Bromford Drive;
  - Fairholme Road;
  - Wood Lane;
  - Kingsleigh Drive;
  - Beechcroft Road;
  - Park Hall Crescent; and
  - B4118 Water Orton Road between the B4118 Chester Road and Parkfield Drive, beyond this an off road cycle route is available to Water Orton.

### *Equestrian Facilities*

- 5.27.66 No dedicated equestrian routes have been identified in the Castle Bromwich and Bromford CFA.

### **Waterways/canals**

- 5.27.67 The Birmingham and Fazeley Canal passes through the Castle Bromwich and Bromford CFA, essentially following the alignment of the A38 Tyburn Road, which runs in a south westerly to north easterly direction from M6 junction 6. At the closest point, the canal is located approximately 650m north of the Proposed Scheme and therefore is not likely to be affected by either the construction or operation of the Proposed Scheme.

### **Air transport**

- 5.27.68 Birmingham Airport is located to the south of the Castle Bromwich and Bromford CFA and therefore discussion of the baseline conditions for air transport is included in the assessment of the Birmingham Interchange and Chelmsley Wood CFA.

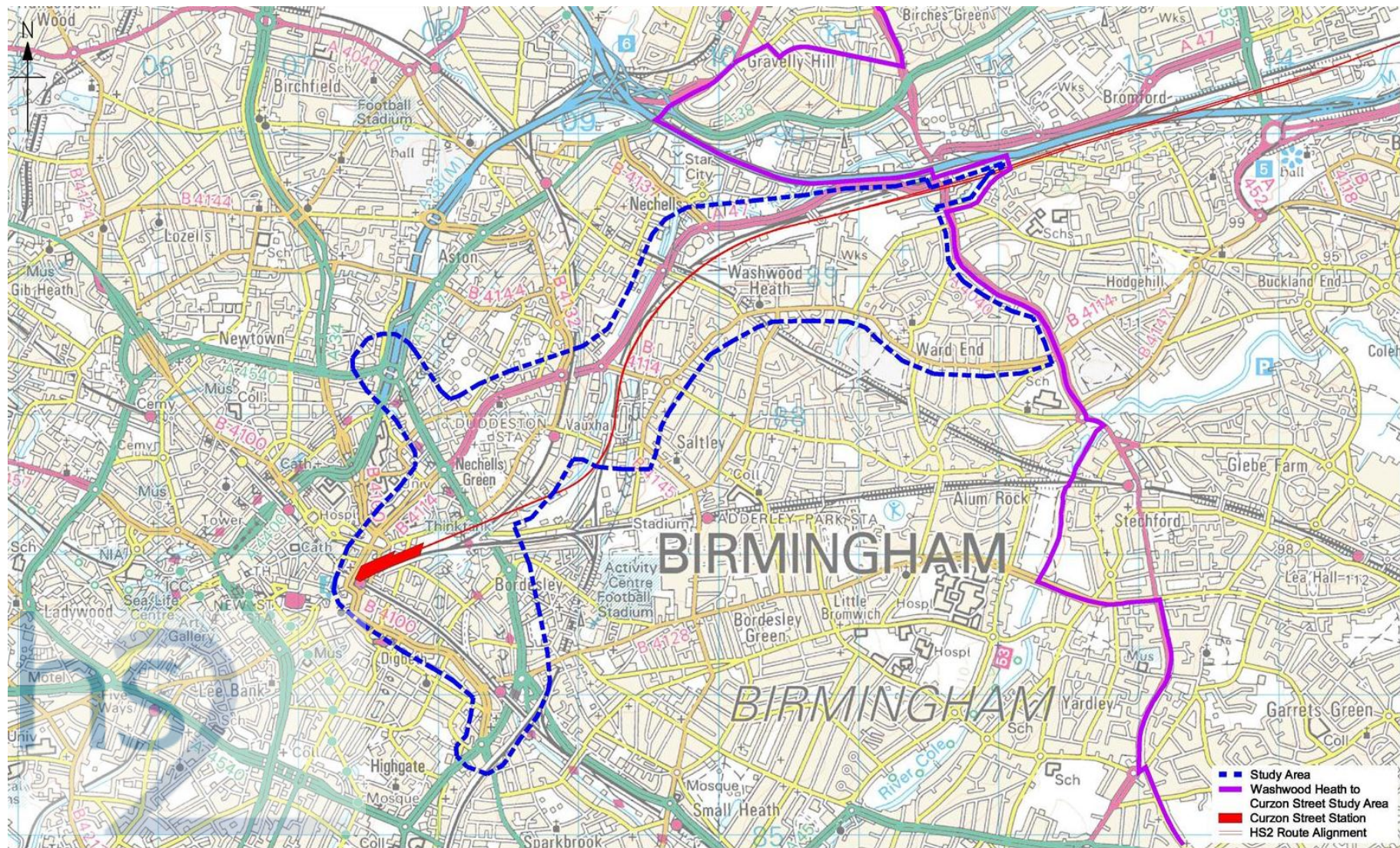
## **5.28 Washwood Heath to Curzon Street (CFA26)**

### **Study area**

- 5.28.2 This section provides an overview of the baseline traffic and transport conditions for the section of the Proposed Scheme that passes through the Washwood Heath to Curzon Street CFA.
- 5.28.3 It describes the transport infrastructure within the Washwood Heath to Curzon Street CFA which will be affected, either during the construction, or during the operation of the Proposed Scheme. The baseline conditions relate to the transport network affected by construction of the Proposed Scheme, including the proposed Washwood Heath Depot site and Curzon Street station and the operational of the proposed depot and Curzon Street station.
- 5.28.4 The scope of work and study area has been discussed with the key transport authorities including Birmingham CC, Centro, the HA, NR and the Canal and River Trust (CRT).
- 5.28.5 The location of the key transport infrastructure can be found in Figure 2, Volume 2 (CFA26 Report) with Figure 5-85 illustrating the core study area for the Washwood Heath to Curzon Street CFA, including A47 Heartlands Parkway and Nechells Parkway, B4114 Washwood Heath Road, A4540 Ring Road between Camp Hill Circus and Dartmouth Circus and the road network local to the proposed Curzon Street station comprising Curzon Street, New Canal Street, B4114 Park Street and B4100 Moor Street Queensway.



Figure 5-85: Washwood Heath to Curzon street study area





- 5.28.6 For ease of reference, the baseline transport conditions for each mode are generally described, where appropriate, from north to south along the proposed route. In addition, some modes of transport have been broken down into areas, including:
- Washwood Heath and Saltley (east of A4540 Ring Road), which represents the environs immediately around the proposed site of the Washwood Heath Depot and the area between the proposed depot site and A4540 Ring Road; and
  - city centre, which for the purpose of this TA covers the A4540 Ring Road between Dartmouth Circus and Camp Hill Circus and the area between the A4540 and Moor Street Queensway, Digbeth High Street and the B4114 Jennens Road.

## Local land uses

### *Washwood Heath and Saltley*

- 5.28.7 The proposed Washwood Heath Depot will be located on predominantly vacant brownfield land which was previously used for industrial purposes. The north eastern parcel of the site is currently occupied by a mail distribution centre operated by UK Mail.
- 5.28.8 The Rugby to Birmingham railway runs alongside the northern boundary of the proposed Washwood Heath Depot. The Proposed Scheme will run to the south of the Rugby to Birmingham railway and, east of the depot site and will pass through a mix of commercial, industrial and generally high density housing.

### *City centre*

- 5.28.9 The Proposed Scheme alignment, between the A4540 and the proposed Curzon Street station site, passes through existing student accommodation, storage facilities, vacant land and an informal pay and display car park. The proposed Curzon Street station will be located on a mix of private pay and display car parks, an area of parkland and vacant buildings including the former Fox and Grapes and Eagle and Tun public houses, within the Eastside Quarter of Birmingham city centre.
- 5.28.10 Major retail and financial sectors are situated immediately west of the proposed Curzon Street station site, with Eastside City Park, Millennium Point and Birmingham City Campus, which make up the Learning Quarter, to the north. In contrast to the area to the north of the Proposed Scheme, the area to the south is dominated by a mix of warehouse and light industrial uses.

- 5.28.11 The Big City Plan establishes Eastside as an 'Area of Transformation' within Birmingham city centre. As part of the Eastside regeneration significant progress has been made in bringing forward major sites for development which to date includes the completion of Millennium Point, Birmingham Metropolitan College and residential buildings at Curzon Gate, Masshouse, the Ormiston Academy and Eastside Multi-story Car Park, the Hotel La Tour, the first phase of Birmingham City University's new Eastside Campus and the new Eastside City Park. The second phase of Birmingham City University's City Centre Campus project gained planning permission in 2012 and work has since begun.

### **Surveys**

- 5.28.12 Transport surveys have been undertaken to obtain baseline data for the impact assessment. Traffic, non-motorised user and station surveys were undertaken in June, August and September 2012 and June and July 2013. The survey locations are shown in Annex B(v).

### *Traffic surveys*

- 5.28.13 The traffic surveys undertaken comprised:
- MCC and queue length surveys at highway junctions. Surveys were undertaken on a weekday between 07:00 and 10:00 and 16:00 and 19:00; and
  - ATC on highway links across the study area. Wherever possible, ATC data was gathered for a continuous two week period to coincide with the date of the MCCs.
- 5.28.14 The traffic survey data has been further supplemented by traffic data extracted from the HA's TRADS database which collects continuous data at various locations around the network.
- 5.28.15 The traffic data showed that for the Washwood Heath to Curzon Street CFA the weekday AM peak hour was 08:00-09:00 and the PM peak hour was 17:00-18:00.

### *Non-motorised user surveys*

- 5.28.16 Non-motorised user surveys were undertaken in August and September 2012 to establish the usage PRoW, roadside footways and footpath links in the vicinity of the Proposed Scheme. The surveys included:
- all roads and associated footways intersected by the Proposed Scheme; and
  - green corridors including footpaths, cycleways, bridleways, river and canal paths.

5.28.17 The August 2012 surveys were carried out between 08:00 and 18:00 on a weekend to capture leisure users. The September surveys were undertaken between 07:00 and 19:00 on a weekday to capture school and commuting users. September surveys were carried out on the routes that were identified as having a school or commuting use.

5.28.18 Weekday and weekend surveys were repeated in July 2013 for PRow within the City Centre area. This followed the opening of the Eastside City Park, which led to the re-opening of the western end of Curzon Street to non-motorised users and the re-assignment of movements to this link.

### *Public transport interchange surveys*

5.28.19 In order to establish the baseline conditions for pedestrian movements within the Moor Street Queensway area, which will form the primary area for pedestrian activity and interchange at Curzon Street station, weekday counts were completed at each crossing point, footway and bus stop along Moor Street Queensway between Masshouse Lane and the Bull Ring Centre. Counts were collected in May 2013 between 07:00-10:00 and 16:00-19:00.

### *Station surveys*

5.28.20 Birmingham New Street station surveys were carried out on a weekday between 06:00 and 21:00 and included:

- parking accumulation and vehicle occupancy surveys at Navigation Street, which is used for long stay station car parking, as the long stay car park which use to serve Birmingham New Street was closed as part of the station redevelopment;
- private car drop off/pick up surveys in the short stay car park and in the vicinity of the station entrance. The surveys included the number of vehicles, dwell time and number of people picked up and dropped off;
- taxi drop off/pick up surveys at the station. The data recorded included the number of taxis, dwell time and number of people picked up and dropped off;
- passenger counts (both directions) at the Birmingham New Street ticket barriers. The following locations were surveyed:
  - at the main station entrance; and
  - at the Navigation Street entrance.
- interview surveys carried out between 07:00 and 10:00 and 16:00 and 19:00 at the following locations:
  - at the main station entrance; and
  - at the Navigation Street entrance.

- 5.28.21 The interview surveys of long distance rail travellers gathered data on mode of travel to/from the station, origin and destination, frequency of trip and journey purpose.

#### *Parking surveys*

- 5.28.22 Parking surveys were completed at the Curzon Street and Millennium Point car parks, as these form the closest long stay car parks to Curzon Street station. Arrival and departure counts were undertaken on Tuesday 12th June 2012, between the times of 06:00 and 21:00.

#### **Highway network**

- 5.28.23 The following section describes the roads that will be impacted by the Proposed Scheme, either during construction, or during operation. Both the Washwood Heath Depot and Curzon Street station are well connected to the strategic road network, with the M6, A38, A38M, A45, A4540 Ring Road and A47 within 1.5km. The key junction forming access to the proposed depot will be the A4040 Bromford Lane/Wolseley Drive junction, whilst Curzon Circle and Curzon Street will form the main access junction for vehicle trips at Curzon Street station.

#### *Strategic road network*

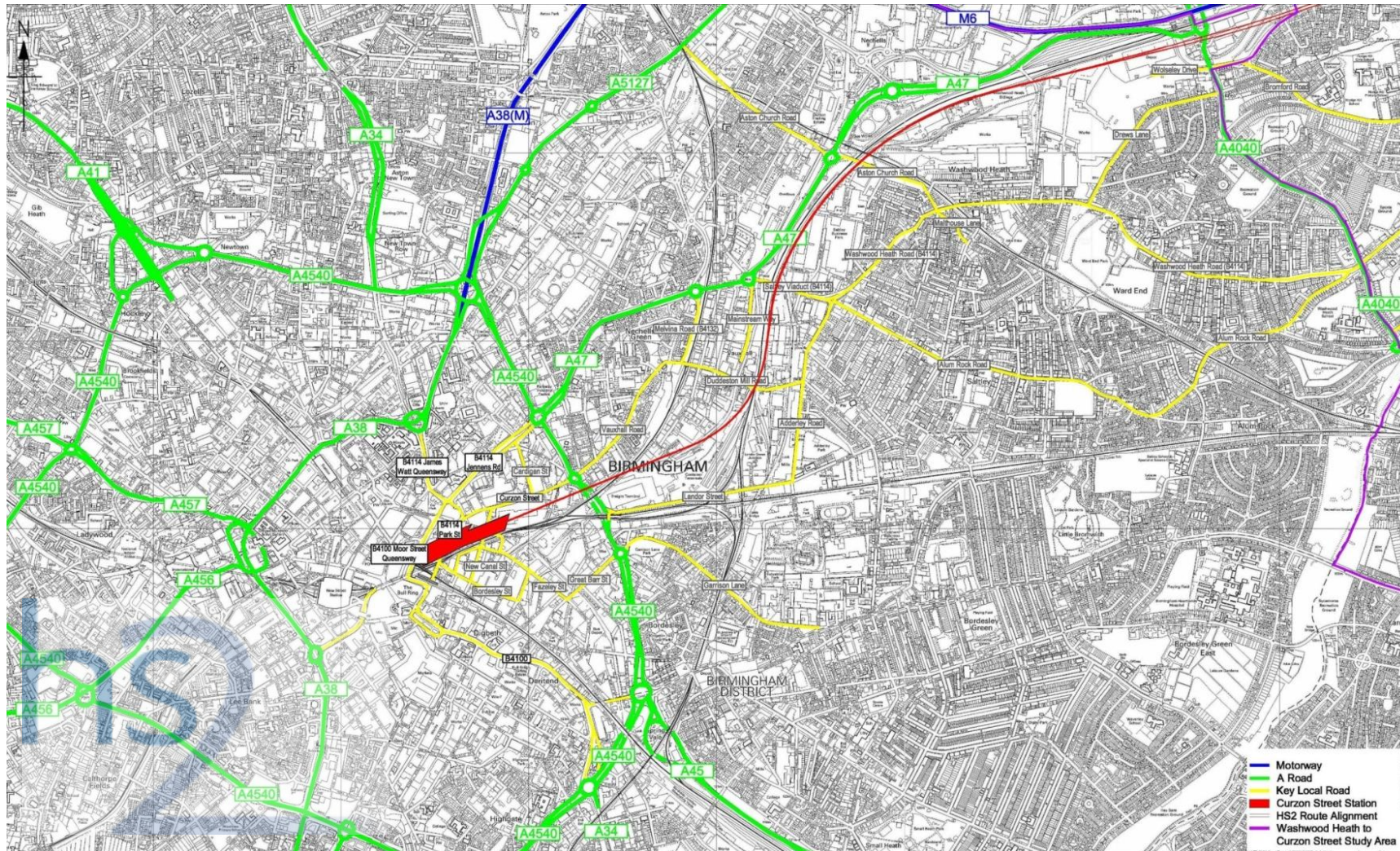
- 5.28.24 The strategic road network is shown on Figure 5-86.

#### **Motorway network**

- 5.28.25 The M6 is a dual three lane motorway which forms the northern section of the motorway 'box' around Birmingham. Junction 6 of the M6 is a grade separated junction and is the primary gateway into Birmingham City Centre via the A38(M) and also provides access to other central and northern parts of Birmingham and beyond via the A38 and A5127.



Figure 5-86: Strategic road network





### Primary 'A' roads

- 5.28.26 The A47 is a continuous two lane carriageway linking Castle Bromwich and Bromford to the west with Birmingham City Centre to the east. The A47 extends from the A452 at Spitfire Island to the A4540 at Ashted Circus, both of which are four-arm at grade roundabouts. Travelling towards the city centre there is a 'high occupancy vehicle lane' which starts at Fort Dunlop and terminates at the A4540. It operates between 7am and 10am, Monday to Friday. The A47 speed limit is generally 64kph (40mph).
- 5.28.27 The A4040 Bromford Lane runs from north to south, connecting Erdington to Stechford and Ward End and areas beyond. The A4040 passes directly to the east of the site of the proposed Washwood Heath Depot. It forms part of the Birmingham Outer Ring Road and intersects the A47 at Bromford Island, a four arm signalised roundabout. South of Bromford Island the speed limit is generally 30mph, whilst north of this junction it increases to 64kph (40mph).
- 5.28.28 The A4040 Bromford Lane/Bromford Road/Wolseley Drive junction, 0.2km south of Bromford Island, is a four arm signalised junction. Wolseley Drive provides access to the UK Mail site and will be the only vehicular access to the proposed depot site.
- 5.28.29 The A4540 Ring Road forms a defined physical boundary for the city centre, providing a route around the city centre for through traffic and to access and egress destinations within and outside the city centre. The A4540 is predominantly comprised of a two lane dual carriageway with a maximum speed limit of 64kph (40mph), although three lanes are provided on the approaches to a number of junctions and in certain sections fronting residential areas the speed limit is 30mph. In the Washwood Heath to Curzon Street CFA the A4540 Ring Road has junctions with:
- A38(M) to the north and A38 to the south at Dartmouth Circus, a grade separated signalised roundabout with 4 arms;
  - Lister Street, a 4 arm signalised cross roads;
  - B4114 Jennens Road and A47 Nechells Parkway at Ashted Circus, an at-grade 4 arm roundabout;
  - Curzon Street and Vauxhall Road at Curzon Circle, an at-grade 4 arm roundabout;
  - Garrison Lane and Great Barr Street at Garrison Circus, an at-grade 4 arm roundabout;
  - A45 Small Heath Highway and Coventry Road at Bordesley Circus, an at-grade roundabout with 5 arms; and
  - A34 Stratford Road and Camp Hill at Camp Hill Circus, an at-grade 4 arm roundabout.

- 5.28.30 To the north of Dartmouth Circus is the A38(M) Aston Expressway, which extends as far as the M6 junction 6. The A38(M) is 3km in length, has a total of 7 lanes and has a tidal flow system which enables the central lane to be opened up in either direction to provide additional capacity. Its operation is managed by Birmingham CC and the speed limit is 81kph (50mph).
- 5.28.31 The A38 also extends southwards from Dartmouth Circus, passing through and beyond the city centre, providing important links to the central business district, University of Birmingham, suburbs to the south of the city centre and the M5.
- 5.28.32 Access by car towards the vicinity of the proposed Curzon Street station is provided from the A4540 Lawley Middleway/Curzon Street junction at Curzon Circle. Two lanes are provided on the A4540 approaches and one lane on Vauxhall road and Curzon Street. These approaches flare close to the stop line to provide additional capacity.
- 5.28.33 Garrison Circus, sits approximately 450m to the south of Curzon Circle and comprises a four arm roundabout connecting the A450 with Great Barr Street and Garrison Lane. The junction features signalised crossings on the A4540 arms of the roundabout.
- 5.28.34 Approximately 1.5km south of Curzon Circle is Bordesley Circus, which provides connections between the A4540 and A45. The A45 is generally a dual two lane carriageway linking Birmingham city centre to Solihull, the M42, Coventry and the M1. Speed limits vary between 64kph (40mph) and 97kph (60mph) within the Birmingham area.
- 5.28.35 A further 0.5km southwest of Bordesley Circus is Camp Hill Circus which affords access between the A4540 and the A34 Stratford Road and subsequently the A41 Warwick Road. The A34 and A41, form two arterial routes into the city centre principally from Solihull and the M42 corridor. The two roads also encompass a number of local centres such as Sparkhill and Acocks Green. Both roads generally take the form of two-way single lane carriageways.

### *Local road network*

#### **Washwood Heath and Saltley**

- 5.28.36 The local road network is shown on Figure 5-86.
- 5.28.37 Wolseley Drive is a two-way single carriageway road and is subject to a 30mph speed restriction with a continuous footway on its southern side. Its primary function is to provide access to small industrial businesses along its length and the UK Mail depot.

- 5.28.38 Approximately 0.15km south of Wolseley Drive is Drews Lane, which is a two-way single carriageway and subject to a 30mph speed restriction. The road provides access to residential properties and connects the A4040 Bromford Lane and B4114 Washwood Heath Road.
- 5.28.39 The B4114 Washwood Heath Road runs from east to west and connects the A4040 Bromford Lane with the High Street, just to the south of Saltley Viaduct. Over most of its length Washwood Heath Road is a two-way single carriageway and subject to a 30mph speed limit. Although there are short sections of dual carriageway at its western and eastern ends.
- 5.28.40 Aston Church Road and High Street (Saltley Viaduct) provide connections between the A47 and Washwood Heath Road. Both are two-way single carriageway roads with a 30mph speed limit, providing access to industrial units and Saltley Business Park.
- 5.28.41 The western end of B4114 Washwood Heath Road connects with Adderley Road, which provides links towards the city centre via either a combination of Duddeston Mill Road and Vauxhall Road, or Landor Street. The former route passes under the Rugby to Birmingham railway connecting with the A4540 at Curzon Circle. Landor Street provides access to the Freightliner site as well as the Duddeston Mill Trading Estate and Arden Industrial Estate, connecting with the A4540 Lawley Middleway via a left in/left out junction between Curzon Circle and Garrison Circus. Both routes are two-way single carriageway roads and subject to a 30mph speed limit.

### **City centre**

- 5.28.42 B4114 Jennens Road runs parallel to Curzon Street and forms a main route into the city centre from the east. Jennens Road is a 30mph dual carriageway with one lane dedicated to buses and cycles. It links, via the James Watt Queensway/Masshouse Lane gyratory, to B4100 Moor Street and B4114 Park Street.
- 5.28.43 Cardigan Street is a two-way minor single carriageway road connecting the B4114 Jennens Road (north) to Curzon Street (south). It principally serves the Millennium Point car park and Eastern Row and will serve the expanded Birmingham City University Campus. It is temporarily closed to traffic as part of the development of the Birmingham City Centre Campus.
- 5.28.44 Vehicular access to the proposed Curzon Street station will be available from Curzon Street, which comprises a two-way single carriageway road subject to a 30mph speed limit. On street parking is currently available, albeit intermittently on both sides of Curzon Street.

- 5.28.45 Curzon Street connects with New Canal Street and then Meriden Street, linking to the B4100 Digbeth High Street to the south. Both New Canal Street and Meriden Street are two-way 30mph two-way single carriageway roads, with sufficient road space available to facilitate on street parking, without interruption to vehicle movements. New Canal Street passes underneath the Rugby to Birmingham railway.
- 5.28.46 New Canal Street also connects with Banbury Street, at the point where it passes underneath the Rugby to Birmingham railway. This road provides access at its eastern end to the Birmingham Gun Barrel Proof House.
- 5.28.47 New Canal Street connects with Fazeley Street and Bordesley Street, which run east to west between Floodgate Street and B4114 Park Street and also provide access to small local industrial business units and warehouse facilities.
- 5.28.48 B4114 Park Street runs perpendicular to Fazeley Street and Bordesley Street and is the main access route from the city centre to the Digbeth area. Park Street is a one-way two lane road and provides a link from the James Watt Queensway/Masshouse Lane gyratory to the north end of Digbeth High Street.
- 5.28.49 Moor Street Queensway runs parallel to Park Street and is an urban two-way dual carriageway, subject to a 32kph (20mph) speed limit. Two lanes are provided in the southbound direction from Masshouse Lane to Park Street. In the northbound direction two lanes are provided from Park Street, although one lane is a bus lane. The carriageway reverts to two lanes for general traffic north of Carrs Lane.

### *Baseline conditions*

- 5.28.50 The review of traffic flows in the Washwood Heath to Curzon Street CFA shows that, typically, the peak hours are 08:00–09:00 and 17:00–18:00.
- 5.28.51 The A47, A4040 and A4540 Ring Road form the main strategic access and/or egress routes for construction and operational traffic related to the proposed Washwood Heath Depot and Curzon Street station. The existing peak hour flows for these links are summarised in Table 5-186.

Table 5-186: Washwood Heath to Curzon Street 2012 baseline AM and PM peak strategic network traffic flows

Link	Direction	AM		PM	
		Total Vehicles	HGVs	Total Vehicles	HGVs
A4040 Bromford Lane (north of Wolseley Drive)	NB	1,597	62	1,467	36
	SB	1,212	50	1,569	47
A47 Heartland Parkway (east of Bromford Island)	EB	639	96	932	83
	WB	1,483	165	756	81

Link	Direction	AM		PM	
		Total Vehicles	HGVs	Total Vehicles	HGVs
A47 Heartland Parkway (south of Aston Church Road)	NB	447	114	975	65
	SB	1,098	126	476	45
A47 Heartlands Parkway (east of Saltley Viaduct)	NB	948	96	1,570	55
	SB	1,656	108	1,058	54
A47 Heartlands Parkway (east of Melvina Road)	EB	1,667	150	1,347	32
	WB	1,318	154	1,492	18
A38 (M) Aston Expressway (north of Dartmouth Circus)	NB	1,807	157	2,952	55
	SB	4,278	199	2,379	123
A38 Corporation Street (south of Dartmouth Circus)	NB	1,294	102	1,457	33
	SB	1,525	114	1,116	11
A4540 Newtown Middleway (west of Dartmouth Circus)	EB	2,413	202	3,630	82
	WB	4,529	240	3,160	160
A4540 Dartmouth Middleway (north of Great Lister Street)	NB	1,439	171	1,644	18
	SB	1,491	139	1,334	30
A4540 Dartmouth Middleway (north of Ashted Circus)	NB	1,318	154	1,492	18
	SB	1,667	150	1,347	32
A4540 Lawley Middleway (north of Curzon Circle)	NB	1,515	192	1,564	42
	SB	1,775	187	1,404	33
A4540 Lawley Middleway (north of Garrison Circus)	NB	1,975	174	1,853	32
	SB	1,996	227	1,710	35
A4540 Watery Lane Middleway (north of Bordesley Circus)	NB	1,682	130	1,141	15
	SB	1,691	165	1,433	26
A4540 Bordesley Circus (north of Camp Hill Circus)	NB	1,073	112	1,094	43
	SB	1,171	115	1,392	31
A4540 Highgate Middleway (south West of Camp Hill Circus)	NEB	1,510	75	1,408	22
	SWB	1,332	138	1,308	47
A45 Small Heath Highway (south of Bordesley Circus)	NB	1,026	113	614	70
	SB	796	201	1,098	67
A34 Stratford Road (south of Camp Hill Circus)	NB	1,320	58	1,467	19
	SB	1,085	61	1,305	36

5.28.52 A number of local roads will also be impacted by the construction or operation of the Proposed Scheme and the existing flows on these routes are summarised in Table 5-187 below.

Table 5-187: Washwood Heath to Curzon Street 2012 baseline AM and PM peak local network traffic flows

Link	Direction	AM		PM	
		Total Vehicles	HGVs	Total Vehicles	HGVs
Aston Church Road	NB	333	35	580	31
	SB	485	42	438	23
B4114 Washwood Heath Road (West of Aston Church Road)	NEB	305	63	459	46
	SWB	418	60	332	41
Pennine Way	NB	73	11	17	10
	SB	34	13	63	2
Dorset Road	EB	49	3	13	1
	WB	31	1	54	0
Saltley Viaduct	EB	686	92	794	70
	WB	830	98	746	63
B4145 Adderley Road (South of Saltley Viaduct)	NEB	265	50	414	21
	SWB	343	44	293	14
Duddeston Mill Road	EB	597	55	813	40
	WB	494	69	324	17
Melvina Road	NB	320	23	372	6
	SB	386	16	213	9
B4114 Jennens Road	EB	291	45	518	4
	WB	628	45	431	40
Cardigan Street (temporarily closed)	NB	0	0	0	0
	SB	0	0	0	0
Curzon Street (east of Cardigan Street)	EB	147	12	470	3
	WB	279	16	166	1
Curzon Street (west of Cardigan Street)	EB	141	13	394	3
	WB	223	17	99	1
New Canal Street (south of Curzon Street)	NB	761	154	946	107
	SB	184	113	363	122



Link	Direction	AM		PM	
		Total Vehicles	HGVs	Total Vehicles	HGVs
Banbury Street	EB	112	107	112	107
	WB	619	77	635	22
Andover Street	NB	997	97	867	52
	SB	157	13	416	3
Fazeley Street (east of New Canal Street)	EB	226	17	154	1
	WB	64	3	60	1
Fazeley Street (west of New Canal Street)	EB	56	2	50	1
	WB	160	14	140	2
New Bartholomew Street	SB	89	5	124	3
Bordesley Street (east of New Canal Street)	EB	204	18	280	4
	WB	69	5	116	2
Bordesley Street (west of New Canal)	EB	204	18	280	4
	WB	69	5	116	2
Meriden Street (south of Bordesley Street)	NB	23	1	29	1
	SB	69	8	63	1
B4100 Digbeth (east of Meriden St)	EB	44	4	70	2
B4100 Moat Lane (east of Meriden St)	WB	71	5	78	3
B4100 Digbeth (west of Meriden St)	EB	12	3	14	1
B4100 Moat Lane (west of Meriden St)	WB	59	4.89	54	1
B4114 Park Street	SB	109	24	225	8
B4100 Park Street (south of Moor Street)	NB	78	67	218	66
	SB	659	77	593	22
Moor Street Queensway (north of Masshouse Lane)	NB	124	124	126	126
Masshouse Lane	EB	722	156	823	118
Moor Street Queensway (south of Masshouse Lane)	NB	432	109	820	92
	SB	256	24	421	8
Moor Street	EB	843	166	1,242	119
	WB	930	211	1,029	150

- 5.28.53 A total of six strategic junctions have been identified as having the potential to be impacted by the proposed scheme in regards to traffic flows and/or changes to the strategic highway network. Junction modelling has been undertaken to determine the existing conditions at these junction in terms of capacity and operation. The results of junction modelling are summarised below. The junctions have been modelled using traffic turning movement and queue survey data, as well as signal timings provided by Birmingham CC where appropriate.

#### A4040 Bromford Lane/Wolseley Drive

- 5.28.54 Table 5-188 and Table 5-189 show the existing operation of the A4040 Bromford Lane/Wolseley Drive junction in the weekday AM and PM peak hours. This junction will form the main connection point between the strategic network and the proposed Washwood Heath Depot.

Table 5-188: A4040 Bromford Lane/Wolseley Drive AM and PM peak results – DoS/queues

A4040 Bromford Lane and Wolseley Drive	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	DoS (%)	Max Queue (PCU)	DoS (%)	Max Queue (PCU)
<b>Arm</b>	<b>2012</b>			
Bromford Lane (N)	85.8	40.5	74.1	35.8
Bromford Road	85.5	15.1	73.1	6.1
Bromford Lane (S)	59.3	22.6	41.7	15.4
Wolseley Drive	26.0	1.2	55.6	2.6

Table 5-189: A4040 Bromford Lane/Wolseley Drive AM and PM peak results – flows/delays

A4040 Bromford Lane and Wolseley Drive	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	Flows	Total Delay (PCU)	Flows	Total Delay (PCU)
<b>Arm</b>	<b>2012</b>			
Bromford Lane (N)	1,392	16.1	1,654	9.7
Bromford Road	696	8.1	382	5.2
Bromford Lane (S)	989	8.1	961	4.3
Wolseley Drive	75	1.1	123	2.1

- 5.28.55 The tables above show that junction currently operates within capacity. The longest queues occur on the A4040 Bromford Lane north and south approaches in the AM peak. The mean maximum queue lengths can be accommodated within the available storage.

## A47 Heartlands Parkway/Aston Church Road Roundabout

- 5.28.56 Table 5-190 and Table 5-191 show the existing operation of the A47 Heartlands Parkway/Aston Church Road roundabout for the weekday AM and PM peak hours. The results indicate that junction currently operates within capacity. The maximum queue is observed on the A47 Heartlands Parkway (N) arm, at two PCU in the AM Peak.

Table 5-190: A47 Heartlands Parkway/Aston Church Road roundabout baseline modelling results (PCU) – RFC/queues

A47 Heartlands Parkway/Aston Church Road Roundabout	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	RFC	Max Queue (PCU)	RFC	Max Queue (PCU)
<b>Arm</b>	<b>2012</b>			
A47 Heartlands Parkway (N)	0.61	1.62	0.31	0.46
Aston Church Road (E )	0.39	0.69	0.26	0.36
A47 Heartlands Parkway (S)	0.22	0.34	0.43	0.78
Aston Church Road (W)	0.23	0.33	0.53	1.15

Table 5-191: A47 Heartlands Parkway/Saltley Viaduct roundabout baseline modelling results (PCU) – flows/delays

A47 Heartlands Parkway/B4114 Saltley Viaduct Roundabout	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	Flows	Total Delay (PCU-min)	Flows	Total Delay (PCU-min)
<b>Arm</b>	<b>2012</b>			
A47 Heartlands Parkway (N)	1146	79.9	542	25.4
B4114 Saltley Viaduct (E)	777	196.4	786	91.1
Mainstream Way (S)	87	16.6	154	14.7
B4114 Saltley Road (W)	948	52.2	1570	115.3

## Ashted Circus

- 5.28.57 Table 5-192 and Table 5-193 show the existing operation of Curzon Circle in the weekday AM and PM peak hours.

Table 5-192: Ashted Circus baseline modelling results (PCU) – RFC/queues

Ashted Circus	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	RFC	Max Queue (PCU)	RFC	Max Queue (PCU)
<b>Arm</b>	<b>2012</b>			
A4540 (N)	0.99	27.45	0.82	4.53
A47 (E)	0.55	1.32	0.33	0.52
A4540 (S)	0.90	8.70	0.95	16.26
B4114 (W)	0.33	0.55	0.59	1.51

Table 5-193: Ashted Circus baseline modelling results (PCU) – flows/delays

Ashted Circus	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	Flows	Total Delay (PCU min)	Flows	Total Delay (PCU min)
<b>Arm</b>	<b>2012</b>			
A4540 (N)	1655	790.8	1,305	213.4
A47 (E)	804	74.3	570	33.3
A4540 (S)	1613	355.7	1,957	547.3
B4114 (W)	356	33.9	571	78.0

- 5.28.58 The tables show that Ashted Circus currently operates over capacity in the AM and PM peaks. The longest queues occur on the A4540 northern arm in the AM Peak (28 PCU) and on the A4540 southern arm in the PM peak (17 PCU). The maximum queue lengths can be accommodated within the available storage on the A4540 without affecting upstream junctions.

### Curzon Circle

- 5.28.59 Table 5-194 and Table 5-195 show the existing operation of Curzon Circle in the weekday AM and PM peak hours. Curzon Circle will form the main junction for vehicle trips to and from Curzon Street station.

Table 5-194: Curzon Circle baseline modelling results (PCU) – RFC/queues

Curzon Circle	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	RFC	Max Queue (PCU)	DoS (%)	Max Queue (PCU)
<b>Arm</b>	<b>2012</b>			
A4540 (N)	0.98	23.2	0.82	4.7
Vauxhall Road	1.02	21.7	0.60	1.5
A4540 (S)	0.92	10.8	0.93	12.4
Curzon Street	0.34	0.6	1.37	83.6

Table 5-195: Curzon Circle baseline modelling results (PCU) – flows/delays

Curzon Circle	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	RFC	Total Delay (PCU)	Flows	Total Delay (PCU)
<b>Arm</b>	<b>2012</b>			
A4540 (N)	1763	691.9	1,432	226.7
Vauxhall Road	598	529.0	509	79.9
A4540 (S)	1989	428.2	2,231	467.9
Curzon Street	159	27.2	564	215.1

- 5.28.60 The tables show that Curzon Circle currently operates over capacity in the AM and PM peaks. The longest queues occur on the Curzon Street arm in the PM peak at 84 PCU. The maximum queue lengths can be accommodated within the available storage on the A4540 without affecting upstream junctions.

### Garrison Circus

- 5.28.61 Table 5-196 and Table 5-197 show the existing operation of Garrison Circus in the weekday AM and PM peak hour.

Table 5-196: Garrison Circus baseline modelling results (PCU) – RFC/queues

Garrison Circus	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	RFC	Max Queue (PCU)	RFC	Max Queue (PCU)
<b>Arm</b>	<b>2012</b>			
A4540 (N)	0.78	3.72	1.02	50.68
Garrison Lane	0.92	9.30	0.92	8.43
A4540 (S)	1.06	71.04	1.37	206.52
Great Barr Street	1.19	28.54	1.06	30.33

Table 5-197: Garrison Circus baseline modelling results (PCU) – flows/delays

Garrison Circus	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	Flows	Total Delay (PCU-min)	Flows	Total Delay (PCU-min)
<b>Arm</b>	<b>2012</b>			
A4540 (N)	2497	201.1	2,098	1,325.3
Garrison Lane	576	271.7	548	261.6
A4540 (S)	1651	1,817.3	1,169	9,065.3
Great Barr Street	260	945.8	586	1,132.1

- 5.28.62 The tables show that Garrison Circus currently operates over capacity, with the longest queuing occurring on the A4540 (South) approach in both peak hours. The maximum queue lengths can be accommodated within the available storage on the A4540 without affecting upstream junctions in both peaks, although interaction with Bordesley Circus may occur in the PM peak.
- 5.28.63 A total of eight local junctions have been identified as having the potential to be impacted by the proposed scheme in regards to traffic flows and/or changes to the strategic highway network. Junction modelling has been undertaken to determine the existing conditions at these junction in terms of capacity and operation. The results of junction modelling are summarised below. The junctions have been modelled using traffic turning movement and queue survey data, as well as signal timings provided by Birmingham CC where appropriate.

## Washwood Heath Road/Aston Church Road

- 5.28.64 Table 5-198 and Table 5-199 show the existing operation of Washwood Heath Road/Aston Church Road signalised junction in the weekday AM and PM peak hours. The results indicate that the junction currently operates within capacity. The greatest queues are observed on the Washwood Heath Road eastern arm in the AM peak at 10 PCU.

Table 5-198: Washwood Heath/Aston Church Road signal junction modelling results – RFC/queues

Washwood Heath/Aston Church Road	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	DoS (%)	Max Queue (PCU)	DoS (%)	Max Queue (PCU)
<b>Arm</b>	<b>2012</b>			
Aston Church Road	75.8	6.6	75.9	7.3
Washwood Heath Road (E)	75.1	9.6	75.3	7.5
Wright Road	34.9	1.9	37.4	1.8
Washwood Heath Road (W)	46.2	4.9	66.2	10.1

Table 5-199: Washwood Heath/Aston Church Road signal junction baseline modelling results – flow/delay

Washwood Heath/Aston Church Road	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	Flows	Total Delays (PCU)	Flows	Total Delays (PCU)
<b>Arm</b>	<b>2012</b>			
Aston Church Road	291	3.3	372	3.6
Washwood Heath Road (E)	821	4.7	603	5.2
Wright Road	102	0.9	115	0.9
Washwood Heath Road (W)	402	1.8	492	2.3

## Adderley Road/Duddeston Mill Road

- 5.28.65 Table 5-200 and Table 5-201 show the existing operation of Adderley Road/Duddeston Mill Road signalised junction in the weekday AM and PM peak hours. The results show that the junction currently operates within capacity. The greatest queues are observed on the Adderley Road northern arm in the AM peak at approximately seven PCU.



Table 5-200: Adderley Road/Duddeston Mill Road signal junction modelling results – RFC/queues

Adderley Road - Duddeston Mill Road	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	DoS (%)	Max Queue (PCU)	DoS (%)	Max Queue (PCU)
<b>Arm</b>	<b>2012</b>			
Duddeston Mill Road	80.0	7.3	71.4	6.8
Adderley Road (N)	77.8	7.8	75.3	6.3
Ash Road	75.8	6.3	75.8	6.2
Adderley Road (S)	61.7	5.1	59.3	4.4

Table 5-201: Adderley Road/Duddeston Mill Road signal junction baseline modelling results – flow/delay

Adderley Road/Duddeston Mill Road	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	Flows	Total Delays (PCU)	Flows	Total Delays (PCU)
<b>Arm</b>	<b>2012</b>			
Duddeston Mill Road	349	4.0	380	3.3
Adderley Road (N)	400	4.0	312	3.4
Ash Road	308	3.4	304	3.4
Adderley Road (S)	301	2.4	249	1.4

### Duddeston Mill Road/Melvina Road

5.28.66 Table 5-202 and Table 5-203 show the existing operation of Duddeston Mill Road/Melvina Road in the weekday AM and PM peak hour. The junction has been modelled using Picady v8. The results indicate that the Duddeston Mill Road (E) currently operates over capacity in the AM and PM peaks, with right turns to Melvina Road delaying traffic travelling along this route. Melvina Road also operates over capacity in the AM peak.

Table 5-202: Duddeston Mill Road/Melvina Road priority junction baseline modelling results – RFC/ queues

Duddeston Mill Road/Melvina Road Priority Junction		AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
		RFC	Max Queue (Vehicle)	RFC	Max Queue (Vehicle)
<b>Arm</b>		<b>2012 DS</b>			
Duddeston Mill Road (W)	Results	0.00	0.0	0.00	0.0
Melvina Road (N)	Results	0.94	11.7	0.62	1.3
Duddeston Mill Road (E)	Results	1.02	22.4	1.28	127.6

Table 5-203: Duddeston Mill Road/Melvina Road priority junction baseline modelling results – flows / delays

Duddeston Mill Road/Melvina Road Priority Junction - Rev A (Amended Geometry)		AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
		Flows	Total Queuing Delay (Vehicle)	Flows	Total Queuing Delay (Vehicle)
Arm		201 DS			
Duddeston Mill Road (W)	Results	243	0.0	99	0.0
Melvina Road (N)	Results	563	435.7	341	80.5
Duddeston Mill Road (E)	Results	645	746.4	878	5,950.0

### Curzon Street/Cardigan Street

- 5.28.67 The Curzon Street/Cardigan Street junction is temporarily closed to traffic, as part of the adjacent Birmingham City University Campus development. The existing operation of the junction has not been modelled. The operation of the junction, following its re-opening, is considered as part of the future baseline assessments.

### New Canal Street/Fazeley Street

- 5.28.68 Table 5-204 and Table 5-205 show the existing operation of the New Canal Street/Fazeley Street signalised junction in the weekday AM and PM peak hours. The results indicate that junction currently operates within capacity in both the AM and PM peak. Small queues are observed on all arms and the predicted mean maximum queue lengths can be accommodated within the available storage.

Table 5-204: New Canal Street/Fazeley Street signal junction modelling results - RFC/queues

New Canal Street/Fazeley Street	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	DoS (%)	Max Queue (PCU)	DoS (%)	Max Queue (PCU)
Arm	2012			
New Canal Street (N)	26.8	3.7	27.5	3.7
Fazeley Street (E)	21.9	2.6	35.6	4.6
New Canal Street (S)	11.7	1.5	36.6	5.2
Fazeley Street (W)	27.1	3.6	35.2	5.1

Table 5-205: New Canal Street/Fazeley Street signal junction baseline modelling results – flow/delay

New Canal Street/Fazeley Street	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	DoS (%)	Max Queue (PCU)	DoS (%)	Max Queue (PCU)
<b>Arm</b>	<b>2012</b>			
New Canal Street (N)	26.8	3.7	27.5	3.7
Fazeley Street (E)	21.9	2.6	35.6	4.6
New Canal Street (S)	11.7	1.5	36.6	5.2
Fazeley Street (W)	27.1	3.6	35.2	5.1

### Moor Street Queensway

5.28.69 Moor Street Queensway/James Watt Queensway and Moor Street Queensway/Masshouse Lane operate as part of a linked signal gyratory. Table 5-206 and Table 5-207 show that the junctions currently operate within capacity. The greatest queues are observed at James Watt Queensway in the PM peak at 22 PCU, which can be accommodated within the available storage areas at the junction.

Table 5-206: Moor Street Queensway Gyratory Baseline Modelling Results – DoS/queues

Moor Street Queensway Gyratory	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	DoS (%)	Max Queue (PCU)	DoS (%)	Max Queue (PCU)
<b>Arm</b>	<b>2012 Moor Street Queensway/James Watt Queensway</b>			
James Watt Queensway	84.8	20.6	88.9	21.8
Jennens Road	69.5	8.8	81.5	12.4
Moor Street Queensway (S)	87.1	12.6	86.7	13.4
<b>Arm</b>	<b>2012 Moor Street Queensway/Masshouse Lane</b>			
Priory Street Queensway	36.0	3.2	41.9	3.9
Masshouse Lane	33.2	3.3	38.7	3.4
Moor Street Queensway (S)	44.5	10.0	50.7	11.5

Table 5-207: Moor Street Queensway baseline modelling results – flows/delays

Moor Street Queensway Gyratory	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	Flows	Total Delay (PCU)	Flows	Total Delay (PCU)
<b>Arm</b>	<b>2012 Moor Street Queensway/James Watt Queensway</b>			
James Watt Queensway	1109	9.6	1,055	11.1
Jennens Road	435	4.8	559	7.2
Moor Street Queensway (S)	938	6.8	1,070	7.1
<b>Arm</b>	<b>2012 Moor Street Queensway/Masshouse Lane</b>			
Priory Street Queensway	187	1.6	224	2.0
Masshouse Lane	394	2.1	392	2.2
Moor Street Queensway (S)	782	3.5	899	4.0

*Moor Street/Park Street*

5.28.70 Table 5-208 and Table 5-209 show the existing operation of the Moor Street / Park Street signalised junction in the weekday AM and PM peak hours. The results indicate that junction currently operates within capacity in both peak periods. The maximum queue for this junction is observed at the Park Street northern arm in the PM peak at 20 PCU.

Table 5-208: Moor Street/Park Street baseline modelling results – DoS/queues

Moor Street/Park Street	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	DoS (%)	Max Queue (PCU)	DoS (%)	Max Queue (PCU)
<b>Arm</b>	<b>2012</b>			
Park Street (N)	34.1	14.5	48.1	19.6
Car Park	2.2	0.1	45.5	4.0
Park Street (S)	46.9	15.5	49.0	15.8
Moor Street	41.7	7.4	48.8	8.8

Table 5-209: Moor Street/Park Street modelling results – Flows/delays

Moor Street/Park Street	AM Peak (08:00 – 09:00)		PM Peak (17:00 – 18:00)	
	Flows	Total Delays (PCU)	Flows	Total Delays (PCU)
<b>Arm</b>	<b>2012</b>			
Park Street (N)	708	4.1	848	5.7
Car Park	3	0.1	106	2.2
Park Street (S)	990	3.2	931	3.4
Moor Street	222	3.6	261	4.3

## Accidents and safety

- 5.28.71 Accident data was obtained from Birmingham CC for the three year period from July 2009 to June 2012.
- 5.28.72 A total of 229 PIA occurred over the three year period in the Washwood Heath to Curzon Street CFA study area, an average of 76 per year. The locations of the accidents are shown on Figure 5-87.
- 5.28.73 Of the 229 accidents, 93% were classified as slight, 6.6% involved a serious injury and 0.4% were fatal accidents. The highest number of accidents occurred at Bordesley Circus (60 accidents), Camp Hill Circus (26 accidents), Moor Street Queensway/Masshouse Lane (18 accidents) and Dartmouth Circus (16 accidents). .
- 5.28.74 Table 5-210 shows a summary of the locations where there were clusters of accidents (nine or more, in the three year period).

Table 5-210: Summary of accidents in the Washwood Heath to Curzon Street area

Location	Year			Severity			Total
	Yr 1	Yr 2	Yr 3	Fatal	Serious	Slight	
Dartmouth Circus	4	5	7	1	1	14	16
Bordesley Circus	27	13	18	0	6	52	58
Garrison Circus	3	6	2	0	0	11	11
Camp Hill Circus	14	5	7	0	2	24	26
Park Street	6	6	2	0	0	14	14
Moor Street Queensway/James Watt Queensway	4	4	4	0	1	11	12
A47/Aston Church Road	4	6	1	0	0	11	11
A47 / B4114 Saltley Viaduct/Mainstream Way	4	3	4	0	0	11	11







## Parking and loading

- 5.28.75 Public car parks and parking restrictions in the local area are shown on Figure 5-88. In Washwood Heath and Saltley, a mix of informal on street parking and private off street parking is available. In the area around Curzon Street station, there are extensive areas of surface level car parking both on and off street.

### *Washwood Heath and Saltley*

- 5.28.76 There are no significant areas of public parking within the vicinity of the proposed Washwood Heath Depot. There are several private off-street car parks associated with businesses and business parks/industrial estates within the local area, including UK Mail, Network Park Industrial Estate, Saltley Business Park and Duddeston Mill Trading Estate.
- 5.28.77 On street parking restrictions are generally present along the A47, B4114 Washwood Heath Road and Saltley Viaduct. No on street parking restrictions are in place on Aston Church Road or side roads linking to Saltley Viaduct.

### *City centre*

- 5.28.78 A number of locations are available within the vicinity of the proposed Curzon Street station site where on-street parking is permitted. This includes the majority of the southern side of Curzon Street, where no parking restrictions are present.
- 5.28.79 The area that directly surrounds Curzon Street is within Birmingham City Councils 'outer' CPZ. This includes Curzon Street to the west of New Canal Street, Banbury Street to the west of New Canal Street, Bartholomew Street, Fazeley Street to the west of New Canal Street, Jennens Road, New Canal Street and Meriden Street. Within the 'outer' zone charging hours are 08:00-18:00 Monday to Saturday.
- 5.28.80 There are six off-street car parks available to the public in close proximity to the proposed Curzon Street station site. All are located within a 400m radius of the proposed main entrance into Curzon Street station and provide a total of 5,859 spaces. These are detailed in Table 5-211.

Table 5-211: Car Parks in the vicinity of proposed Curzon Street station

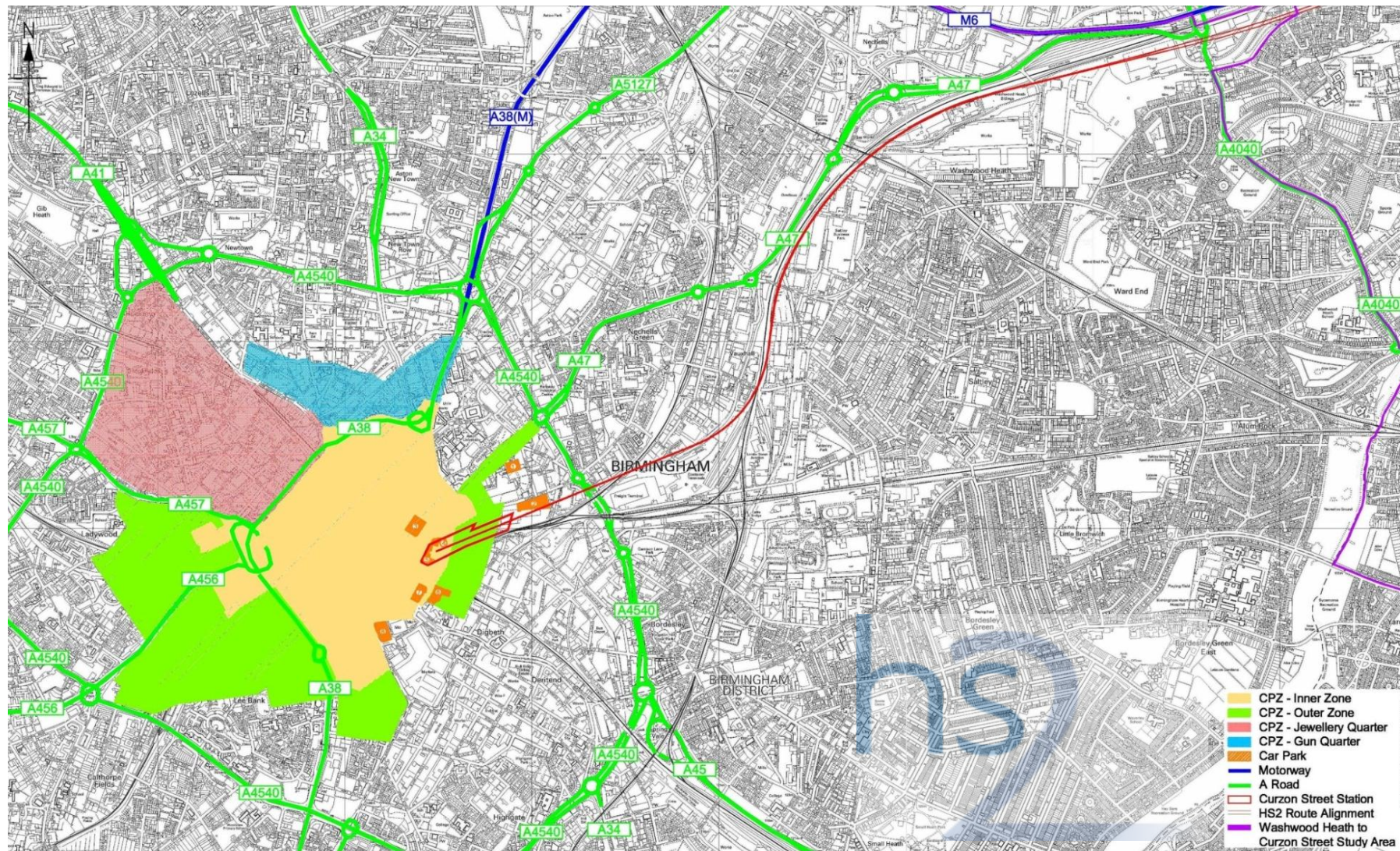
Car Park Name	Number of Spaces	Operator
Millennium Point Multi-Storey Car Park	899	Birmingham CC
Curzon Street Car Park	500	Parking Partners Management Services Limited (Curzon)
Bullring Moor Street Multi-Storey Car Park	1,195	Bullring Limited Partnership
Albert Street Multi-Storey Car Park	1,160	NCP
Bullring Centre Multi-storey Car Park	1,015	Bullring Limited Partnership
Edgbaston Street Multi-Storey Car Park (Bull-Ring)	850	Bullring Limited Partnership
Seymour Street Surface Level Car Park	40 (approx.)	Excel Parking Services Limited
Albert Street Surface Level Car Park	200 (approx.)	Excel Parking Services Limited

5.28.81 At Curzon Street and Millennium Point, surveys undertaken on Tuesday 12th June 2012, between the times of 06:00 and 21:00, showed the following:

- Curzon Street Car Park – the average accumulation across the peak hour was 200; this was between 13:00 and 14:00. Given that this car park has capacity for up to approximately 500 spaces, this equates to 40% of the available spaces and leaves 300 spaces available.
- Millennium Point Car Park – the average accumulation across the peak hour was 552; this was between 13:00 and 14:00. Given that there is the provision of 899 spaces at this car park, this equates to 61.4% of the spaces and leaves 347 available spaces.



Figure 5-88: Public car parks and parking restrictions





## Public Transport

- 5.28.82 The area immediately to the west and south of the proposed Curzon Street station is well served by public transport, with rail (via Birmingham New Street and Moor Street), bus and coach connections all available. The Washwood Heath and Saltley area is also well served by local bus services.
- 5.28.83 The following sections describe the rail, bus and coach services in the Washwood Heath to Curzon Street CFA.

### *Rail network*

- 5.28.84 The long-distance and medium-distance rail network is shown on Figure 5-89. The main strategic railway station in the area is Birmingham New Street, which is located south west of the Curzon Street site in the city centre. It is the principal rail station for Birmingham and is situated on the West Coast Mainline, providing access to national, regional and local rail services.
- 5.28.85 Birmingham New Street served 31,213,842 passengers in 2011/12 (ORR station usage data), the majority of which start or finish their journeys at the station, due to its proximity to Birmingham City Centre and offer of services. 5,117,520 passengers were identified as rail to rail interchange passengers.
- 5.28.86 Table 5-212 summarises the major destinations served by Birmingham New Street and the typical frequencies for these services.

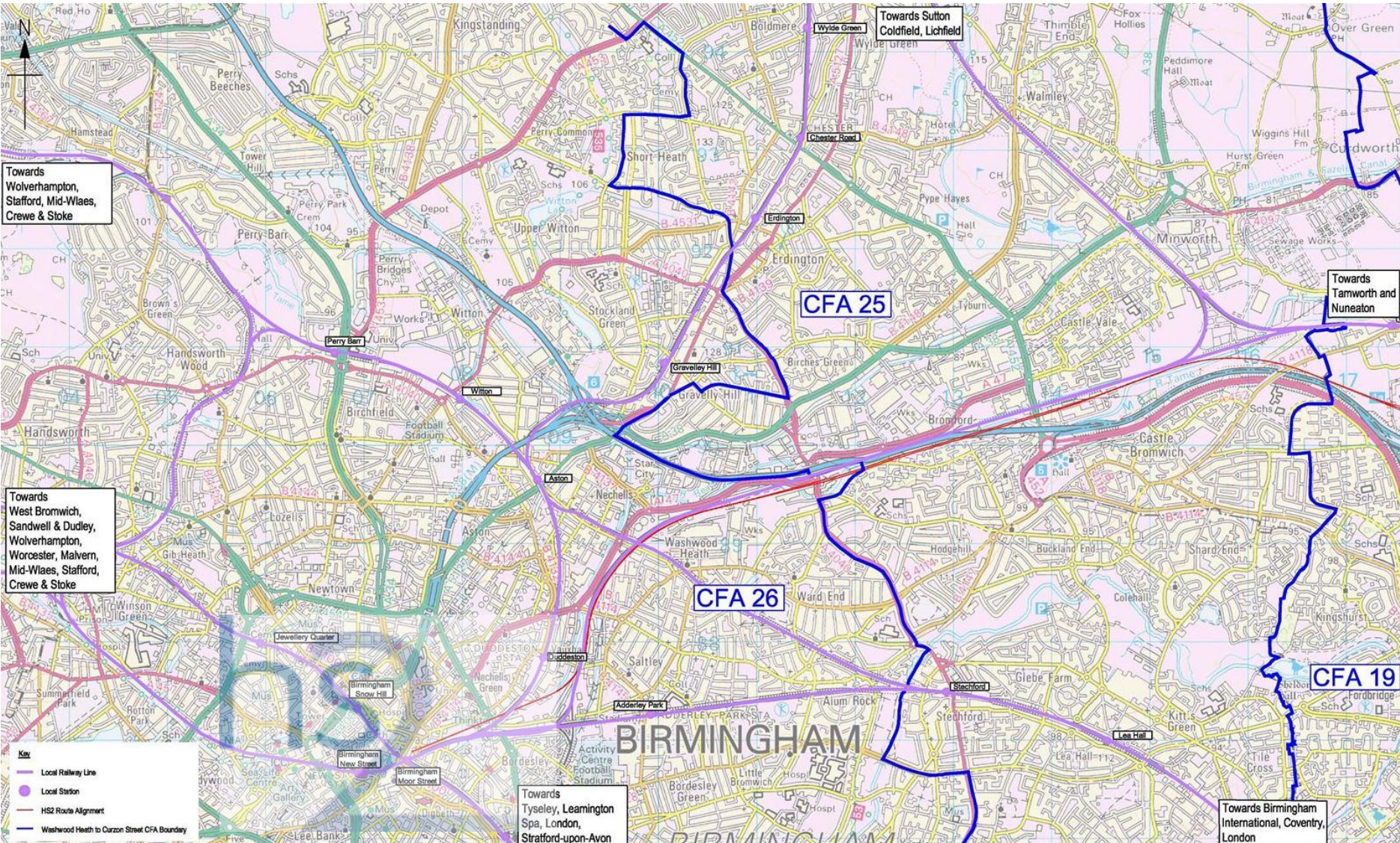
Table 5-212: Summary of major destinations directly accessible from Birmingham New Street (most frequently served)

Destination	Frequency	Operator
Bristol	2 trains per hour	CrossCountry
Coventry	7 trains per hour	CrossCountry, Virgin Trains, London Midland
London Euston	5 trains per hour	London Midland, Virgins Trains
Manchester	2 trains per hour	CrossCountry
Milton Keynes	2 trains per hour	London Midland
Northampton	2 trains per hour	London Midland
Rugby	7 trains per hour	London Midland, Virgin Trains
Wolverhampton	10 trains per hour	CrossCountry, London Midland, Virgin Trains

- 5.28.87 Moor Street station (immediately south of the Curzon station site) and Snow Hill station (west of the site) also offer connections to London Marylebone via the Chiltern railway. These services fall on the same line and operate at a frequency of up to 2 trains per hour.
- 5.28.88 The local rail network is shown on Figure 5-89.



Figure 5-89: Washwood Heath to Curzon Street - rail network





## **Washwood Heath and Saltley**

- 5.28.89 The closest stations to the proposed Washwood Heath Depot within the Washwood Heath to Curzon Street area include Gravelly Hill to the north, Duddeston and Adderley Park to the south west and Aston to the west. These all provide access to local rail services.
- 5.28.90 Aston, Gravelly Hill and Duddeston, are all located on the Cross City line, connecting to Lichfield, Birmingham New Street and Redditch. Up to 6 trains per hour are available at Gravelly Hill.
- 5.28.91 Adderley Park is located on the West Coast Main Line and generally provides one train per hour in each direction serving Birmingham New Street and Birmingham International. An additional hourly service is available in the AM and PM peaks for travel to and from Coventry.

## **City Centre**

- 5.28.92 Birmingham New Street, Moor Street and Snow Hill provide access to local rail services within the City Centre.
- 5.28.93 Destinations available from Birmingham New Street include Lichfield, Tamworth, Redditch, Bromsgrove, Worcester, Hereford, Walsall, Birmingham International Airport and Coventry. Five Ways, Selly Oak, Redditch, Aston, Gravelly Hill, Sutton Coldfield and Lichfield are also accessible from Birmingham New Street, using regional services and the Cross City line, which operates at a frequency of 2 trains per hour in either direction from Birmingham New Street.
- 5.28.94 At Moor Street and Snow Hill station there are up to 6 trains per hour serving Solihull and Stourbridge, up to 4 trains per hour serving Kidderminster and Worcester and up to 3 trains per hour serving Leamington Spa. These services typically also stop at intermediary local stations between Birmingham and these locations.
- 5.28.95 Snow Hill station also forms the current city centre terminus for the Midland Metro light railway from Wolverhampton, which passes through Wednesbury, Bilston and West Bromwich. The Metro Line 1 has a frequency of eight minutes during the day and a 15 minute frequency during evenings and Sundays.

## ***Local bus services***

- 5.28.96 The local bus network is shown on Figure 5-90. There is a wide range of bus service provision in the Washwood Heath to Curzon Street area comprising local buses and national coach services.



## **Washwood Heath and Saltley**

5.28.97 There are seven bus services that pass to the south of the site of the proposed Washwood Heath Depot. These bus routes provide a total of 788 buses on a weekday, 647 buses on a Saturday and 346 buses on a Sunday. The bus services provide connections to Solihull, Coleshill, Chelmsley Wood and Birmingham City Centre. The buses are routed along the following roads within the Washwood Heath to Curzon Street CFA:

- Washwood Heath Road;
- High Street (Saltley Viaduct);
- A47 Nechells Parkway;
- B4114 Jennens Road; and
- B4100 Moor Street Queensway.

## **City Centre**

5.28.98 Moor Street Queensway, which will comprise the main access point to the proposed Curzon Street station for all non-car modes, forms one of six key public transport hubs in the city centre as part of the Birmingham City Centre Interchange Scheme. This hub offers interchange for bus passengers and Moor Street train passengers.

5.28.99 Bus stops are present both sides of Moor Street Queensway, providing access to 29 bus services. These bus routes provide a total of 73 outbound and 81 inbound buses on a weekday morning peak (08:00 – 09:00) and 78 outbound and 81 inbound buses on a weekday evening peak (17:00 – 18:00). Additional stops are also located north and south of the Moor Street Queensway at the Pavilions shopping centre and at Albert Street. Routes which stop on Moor Street Queensway include services travelling along the A45 Small Heath Highway and Coventry Road, A38 Bristol Road and A457 Dudley Road. Locations such as Acocks Green, Five Ways, Edgbaston, Quinton, Halesowen and Walsall are also available from bus stops on Moor Street Queensway.

5.28.100 Some services routing through this area also stop at Park Street, using this road to travel south and east out of the city centre. Seven routes are available from Park Street, serving areas such as Tile Cross, Hawkesley, Kingshurst, Sheldon, Chelmsley Wood, Solihull, Birmingham Airport and Coventry. A total of 488 buses on a weekday, 319 buses on a Saturday and 198 buses on a Sunday are provided by these services.

5.28.101 The following roads form bus routes within the immediate local area to and/or from Moor Street Queensway and Park Street:

- B4114 Jennens Road;
- James Watt Queensway;
- St. Martins Queensway;

- Carrs Lane;
- Albert Street; and
- B4100 Digbeth High Street and High Street Deritend.

5.28.102 In order to consider the bus service utilisation for the radial routes into and out of Birmingham city centre for the AM peak period (08:00 – 09:00), cordon passenger count data supplied by Centro was used. Based on the cordon data and bus frequency information supplied, the total available capacity and the total passenger demand was determined for each of the radial routes in 2011. The calculated baseline bus seat availability, demand and resultant percentage utilisation is outlined in Table 5-213.

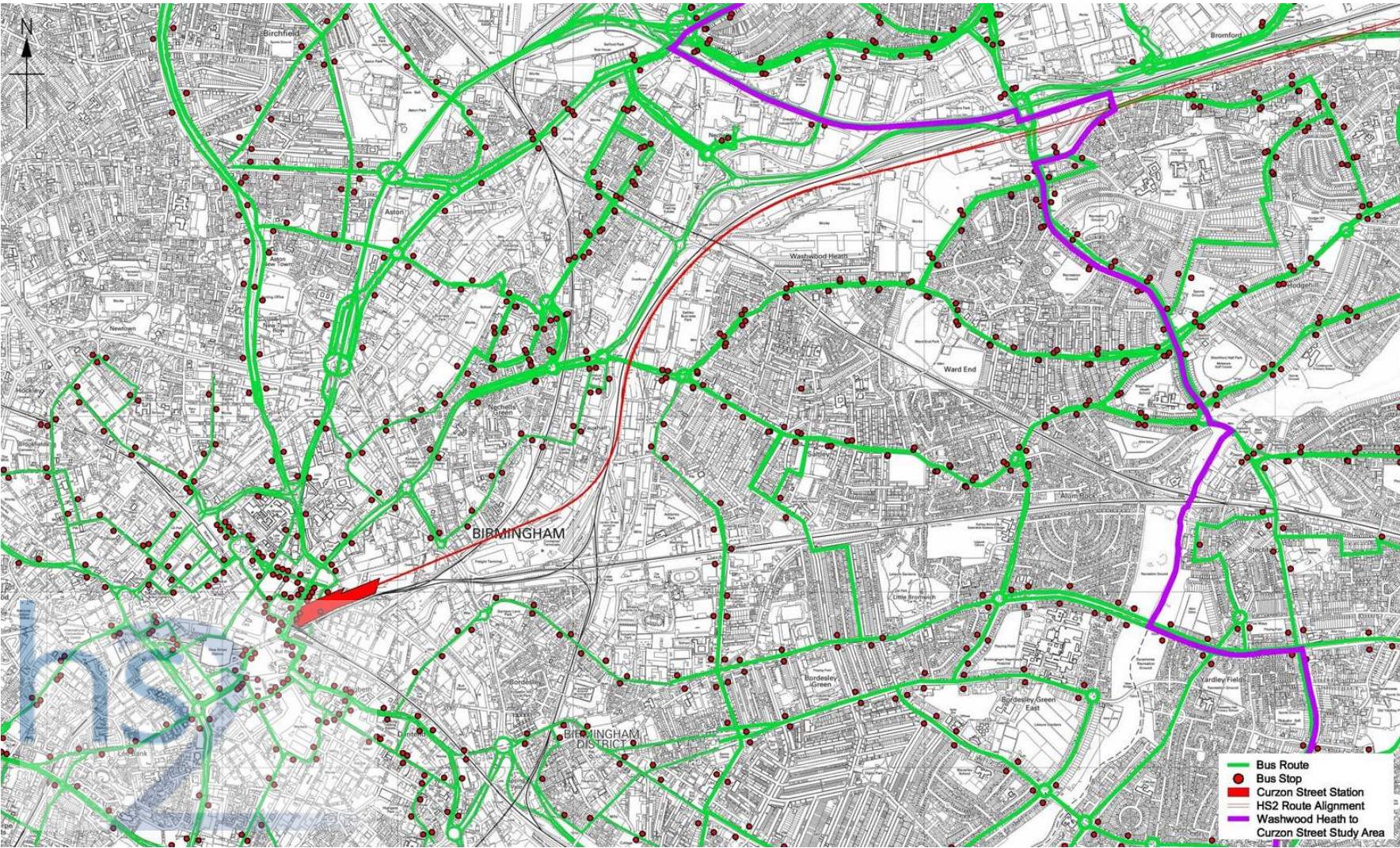
Table 5-213: Baseline Bus demand and capacity (08:00 – 09:00 bi-directional)

Route	Number of services (08:00 – 09:00, inbound and outbound)	Total available bus seats (inbound and outbound)	Total demand (inbound and outbound)	Utilisation (%)
A34	37	2,449	863	35.23%
A34 High Street	40	2,706	969	35.80%
A38M	46	2,803	815	29.07%
A41	66	4,028	1,352	33.56%
A45	57	3,241	1,087	33.53%
A456	50	2,528	814	32.19%
A47	35	2,315	746	32.24%
A441/ A38	65	3,488	2,439	69.92%

5.28.103 It was determined that all of the routes had available capacity on both inbound and outbound services. However, from the data provided by Centro, it was noted that the A47 corridor has standing room available only on some of the inbound services, with an average weekday AM peak seated capacity utilisation of 101.2%.



Figure 5-90: Bus routes that serve Washwood Heath Road, Moor Street Queensway and Park Street





### *Coach services*

- 5.28.104 Birmingham Coach Station is located on Mill Lane in the Digbeth area of Birmingham, approximately 0.5km to the south of the proposed Curzon Street station.
- 5.28.105 Coaches serving this coach station offer services throughout Great Britain and also to Belfast and Dublin. These services are operated by National Express and Megabus.
- 5.28.106 National Express run 48 services daily through Birmingham Coach station travelling to locations such as Gatwick Airport, Weymouth, Southend-on-Sea, Great Yarmouth, Bradford, Cambridge, Bristol, Oxford, Swansea, Cardiff, Paignton, Manchester, Bath, Plymouth, Swindon, Portsmouth, Wolverhampton and London.

### *Public transport interchanges*

- 5.28.107 Moor Street Queensway is one of six major interchanges in Birmingham's city centre which have been provided as part of the Birmingham City Centre Interchange Scheme. The scheme was implemented in 2012 and delivers a major upgrade to bus passenger facilities in the city centre and provides newly designed shelters, bus flags and other passenger facilities including easy to follow information to encourage public transport and walking journeys.
- 5.28.108 The interchanges replace the need for cross city bus services, which no longer exist. The Moor Street Queensway Interchange allows bus passengers and Moor Street station train passengers to interchange and connect to services all over the West Midlands Region. It also serves nearby offices, commercial and retail premises in Birmingham City Centre, including the Bullring shopping centre and Pavilions shopping centre.
- 5.28.109 Moor Street station, located immediately south of the proposed Curzon Street station, is located on the Chiltern railway. The interchange offers opportunities to travel from Moor Street station by rail to London Marylebone, Leamington, Warwick, Solihull, Worcester, Kidderminster and Stourbridge, as well as other local destinations. Bus routes serving Moor Street Queensway provide access to Coventry, Solihull, Walsall, Chelmsley Wood, Acocks Green and other local destinations.
- 5.28.110 Birmingham New Street station, which forms the main station for regional and national services, is within 0.5km walking distance from the western boundary of the proposed Curzon Street station site. There are good opportunities for interchange between New Street and Moor Street stations. Currently, there are two main routes between the stations – via St. Martins Queensway and via Swan Passage and Rotunda Square.

- 5.28.111 The route via St. Martin's Queensway requires pedestrians to cross Moor Street Queensway outside Moor Street station (grade pedestrian crossings are provided), walk along St. Martins Queensway (an underpass beneath the Bull Ring shopping centre) to connect with the pedestrian link to the Stephenson Street entrance of Birmingham New Street, which is currently the main entrance. T
- 5.28.112 he route via Swan Passage and Rotunda Square requires pedestrians to cross Moor Street Queensway outside Moor Street station (grade pedestrian crossings are provided), use the steps (or ramp) provided on Swan Passage, cross Rotunda Square, use the steps (or ramp) provided close to the St Martins Queensway junction with Worcester Street and then use the pedestrian link to access New Street station at Stephenson Street.
- 5.28.113 A taxi rank is provided on Moor Street, on the approach to the Moor Street/Park Street junction and directly adjacent to Moor Street station. It has capacity for up to 9 waiting taxis. No dedicated car parking facilities are provided for Moor Street station, so the majority of trips to and from the station are by public transport or on foot.
- 5.28.114 The function of Moor Street Queensway as a public transport interchange means that there are high levels of pedestrian activity through this area.
- 5.28.115 To consider the existing interchange conditions for pedestrians through Moor Street Queensway, a Fruin Level of Service (LoS) assessment has been completed. This calculates the density of pedestrians at specific walkway or crossing points, through considering the space available to pedestrians at a given location and the corresponding maximum flow per minute for this area (using the May 2013 surveys).
- 5.28.116 Figure 5-91 illustrates the location of each crossing point and walkway assessed. Table 5-214 summarises the results for the AM and PM peaks respectively, at each of these locations. The available gross floor area represents the area of footway (or crossing) available to pedestrians, taking into account street furniture, trees and planted areas and bus stop waiting areas.
- 5.28.117 The maximum pedestrians per minute (maxped/min) represent the maximum flow rate of pedestrians through the area during the peak hour, based on the observed pedestrian movements. The density represents the number of pedestrians per square metre area and this determines the LoS band for that area.
- 5.28.118 The results in Table 5-214 show that during the peak periods, all areas will experience a LoS A, thereby indicating that the existing conditions on Moor Street Queensway are well within capacity.

Figure 5-91: Pedestrian assessment study area

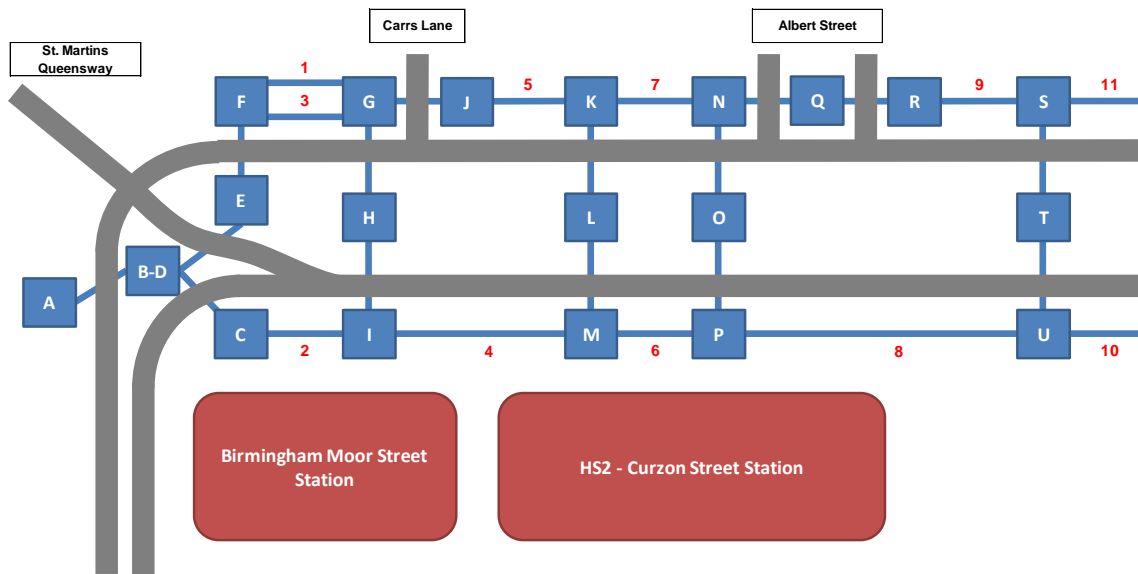


Table 5-214: Summary of Moor Street Queensway pedestrian flows (AM and PM peak)

Area	2013							
	AM				PM			
	Available GFA (m <sup>2</sup> )	MaxPed/ min	Density	LoS Band	Available GFA (m <sup>2</sup> )	MaxPed/ min	Density	LoS Band
1	158.4	1.1	0.01	A	158.4	4.2	0.03	A
3	296.2	29.1	0.10	A	296.2	45.8	0.15	A
2	376.5	12.8	0.03	A	376.5	13.0	0.03	A
4	165.6	20.5	0.12	A	165.6	17.8	0.11	A
5	117.4	5.0	0.04	A	117.4	6.2	0.05	A
6	221.1	27.1	0.12	A	221.1	25.0	0.11	A
7	317.9	17.0	0.05	A	317.9	17.2	0.05	A
8	275.1	26.0	0.09	A	275.1	21.2	0.08	A
9	122.7	14.7	0.12	A	122.7	13.1	0.11	A
10	189.2	12.2	0.06	A	189.2	12.2	0.06	A
11	158.2	12.9	0.08	A	158.2	10.4	0.07	A
A	20.2	4.4	0.22	A	28.1	4.7	0.17	A
F	50.9	4.6	0.09	A	39.0	5.4	0.14	A
G	94.0	10.1	0.11	A	94.9	13.5	0.14	A
I	50.1	4.1	0.08	A	55.7	6.8	0.12	A
J	58.2	2.7	0.05	A	54.3	2.9	0.05	A



Area	2013							
	AM				PM			
	Available GFA (m <sup>2</sup> )	MaxPed/min	Density	LoS Band	Available GFA (m <sup>2</sup> )	MaxPed/min	Density	LoS Band
K	48.3	2.9	0.06	A	45.5	3.9	0.09	A
M	62.5	4.6	0.07	A	60.6	6.0	0.10	A
N	92.3	3.3	0.04	A	95.3	4.2	0.04	A
P	47.9	4.3	0.09	A	46.5	4.2	0.09	A
R	73.2	3.8	0.05	A	68.6	3.9	0.06	A
S	73.0	3.7	0.05	A	70.7	3.5	0.05	A
U	46.5	3.4	0.07	A	46.5	3.3	0.07	A
B	37.1	17.8	0.48	A	37.1	15.2	0.41	A
C	43.7	27.2	0.62	A	43.7	22.4	0.51	A
D	76.5	10.4	0.14	A	76.5	17.4	0.23	A
E	56.0	17.4	0.31	A	56.0	16.8	0.30	A
H	137.5	10.6	0.08	A	137.5	13.6	0.10	A
L	71.3	1.8	0.03	A	71.3	4.4	0.06	A
O	42.8	2.0	0.05	A	42.8	4.4	0.10	A
Q	34.6	13.0	0.38	A	34.6	10.8	0.31	A
T	37.5	3.4	0.09	A	37.5	5.0	0.13	A
B+D	113.6	28.2	0.25	A	113.6	32.6	0.29	A

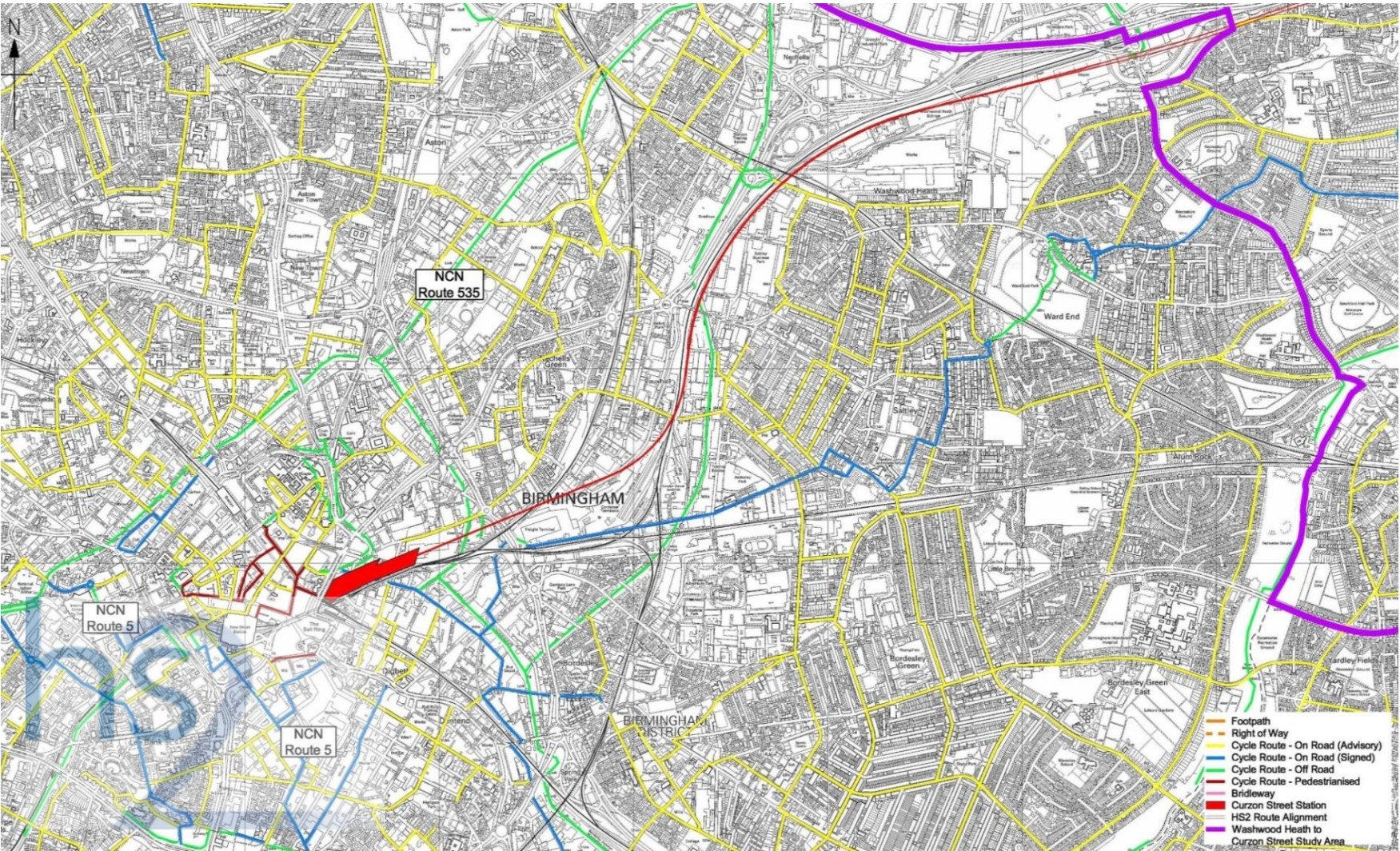
A LoS from the Fruin scale is then assigned, between A and F, according to the density calculated. For walkways, LoS A is free-flowing movement and F means that pedestrian movements are extremely restricted. For areas where queues are expected to form, LoS A allows free movement of pedestrians between standing pedestrians and LoS F means space is equivalent to the standing area of a person; there is no space between people standing. LoS A represents that an area is well within capacity and LoS C generally represents acceptable conditions at transport interchanges.

## Pedestrians, Cyclists and Equestrians

- 5.28.119 The pedestrian and cycle network is shown in Figure 5-92.
- 5.28.120 Dedicated pedestrian and cycle facilities in the Washwood Heath to Curzon Street area are extensive. East of the A4540 Ring Road, the Washwood Heath and Saltley area is well served by pedestrian and cycle facilities as is typical of an urban area. In the area around Curzon Street, pedestrian and cycle facilities are provided to facilitate access to the city centre, transport hubs businesses, with the on-going regeneration of the Eastside area and in particular the development of Eastside City Park enhancing local facilities and connections for non-motorised users.
- 5.28.121 The following sections identify the pedestrian and cycle facilities in the study area.



Figure 5-92: Pedestrian and cycle facilities in the study area





### *Pedestrian facilities*

#### **Washwood Heath and Saltley**

- 5.28.122 Wolseley Drive, to the east of the proposed site, has a continuous footway on its southern side. The footway on the north side of Wolseley Drive begins approximately 100m west of the junction with the A4040 Bromford Lane. No formal pedestrian crossing facilities are provided at this junction however dropped kerbs and pedestrian refuge islands are provided at each approach.
- 5.28.123 Extensive footways surround the Washwood Heath Depot site affording access to surrounding industrial and residential areas and public transport stops. The A4040 Bromford Lane, Washwood Heath Road, Aston Church Road and the A47 Heartlands Parkway, which bound the site to the east, south, west and north respectively, provide footways on both sides. Aston Church Road also connects with an existing minor access road to the south of the Aston Church overbridge, which offers access to the depot site from the west.
- 5.28.124 A towpath also runs adjacent to the Grand Union Canal, west of the proposed Washwood Heath Depot, passing north to south through the study area. The towpath crosses beneath the A47 Heartlands Parkway, Saltley Viaduct and Duddeston Mill Road, extending to the city centre, where it links with the Digbeth Branch Canal towpath.

#### **City centre**

- 5.28.125 A wide range of pedestrian links are available in the vicinity of the proposed Curzon Street station site. Footways are present on both sides of Curzon Street, Cardigan Street and New Canal Street which form the immediate links to and from the site to areas such as Jennens Road (north), Digbeth (south) and Moor Street Queensway (west).
- 5.28.126 To the west of the Curzon Street station site, Moor Street Queensway links Moor Street station and the proposed development site, providing access to the Bullring shopping centre and Pavilions shopping centre, as well as towards Birmingham New Street station. A series of at-grade pedestrian facilities are available to facilitate crossing of Moor Street Queensway.
- 5.28.127 The regeneration of the Eastside will result in the further development of improved pedestrian and public realm facilities within the area to deliver a high quality pedestrian environment between the Moor Street Queensway and the Eastside City Locks. The opening of Eastside City Park in December 2012 forms the first stage of this process, providing improved linkage between Moor Street Queensway, Millennium Point, Albert Street, Bartholomew Street and Park Street.

### Non-motorised user flows

- 5.28.128 Table 5-215 lists the survey locations/ routes where use by pedestrians, cyclists and horses exceeded 20 per day. The locations for all surveys completed are shown on Figure 5-93. As well as the locations shown in Figure 5-93, an existing public footpath crosses the proposed Washwood Heath Depot site and links Common Lane and Bromford Island. However, this footpath is currently blocked at the Common Lane end and therefore this footpath is currently not in use.
- 5.28.129 Surveys were undertaken in August 2012 (weekend) and September 2012 (weekday) at all locations where the route of the Proposed Scheme crosses PRowS, roadside footways and footpath links, to capture leisure users and school/commuting users. The 2012 surveys were undertaken during the construction of Eastside City Park, which resulted in the temporary closure of a number of pedestrian routes within the area. Surveys undertaken in the vicinity of this area were repeated in July 2013 to better reflect the current baseline conditions. Seven routes were re-surveyed at a weekend and during the week. Surveys were undertaken at a total of 22 locations.
- 5.28.130 During the weekend surveys, five of the routes were used by less than 20 people in the 10 hour survey period. The routes with the greatest usage were Fazeley Street with 862 users, Park Street with 444 users, the footpath link across the grass area between Fazeley Street and Park Street with 201 users and New Canal Street (to the north of the Banbury Street/New Canal Street junction) with 186 users.
- 5.28.131 During the weekday surveys, two of the routes were used by less than 20 people in the 12 hour survey period. The routes with the greatest usage were Fazeley Street with 1633 users, Park Street with 664 users and the footpath link across the park between Fazeley Street and Park Street with 585 users.

Figure 5-93: PRoW survey locations

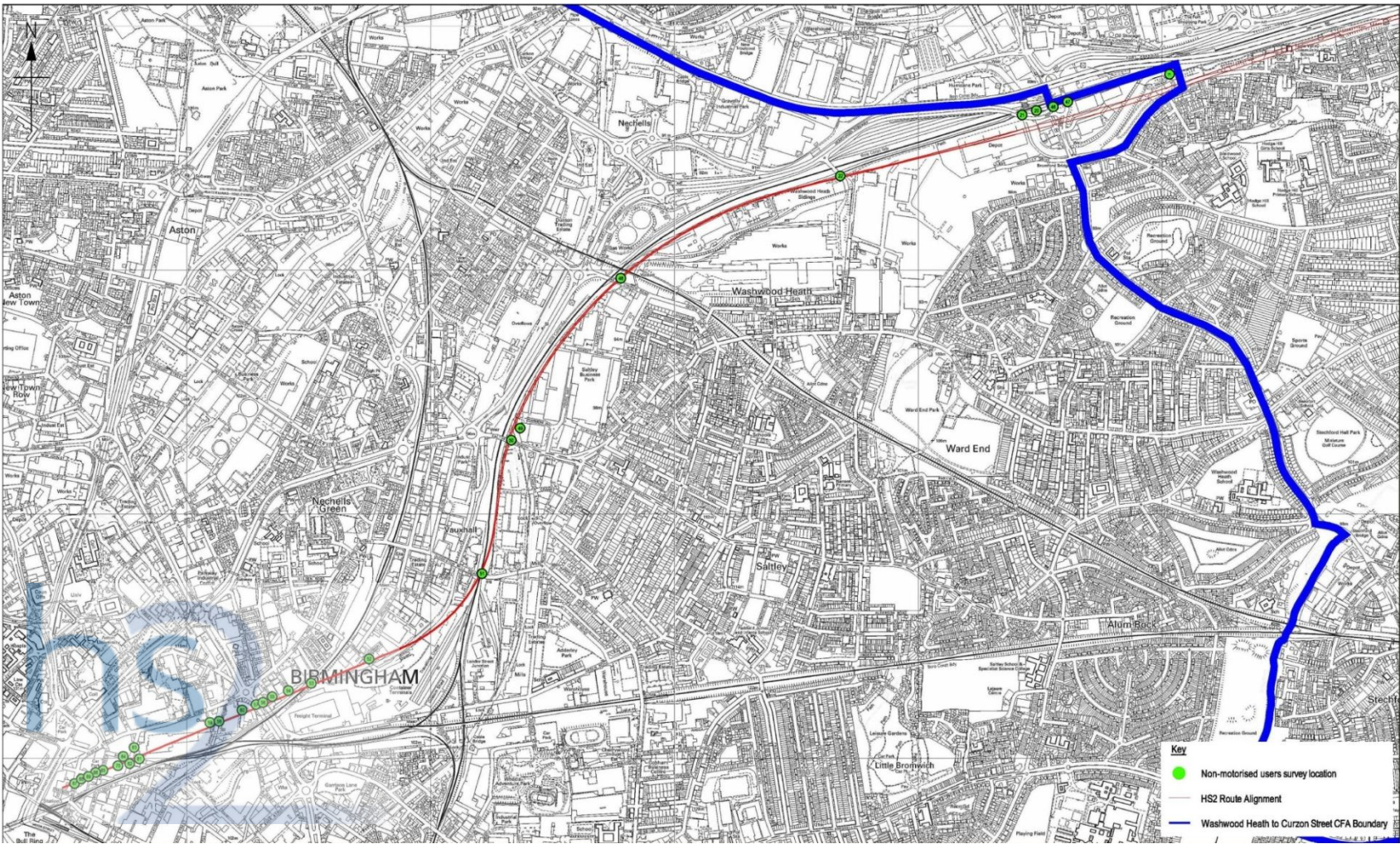




Table 5-215: Non-motorised user survey locations

Description of Location	Maximum Number of Daily Users
Aston Church Road between the A47 Heartlands Parkway junction to the west and Arley Road junction to the east	209
Grand Union Canal (eastern side) near Pembroke Way, between Saltley Viaduct and the railway line	22
Saltley Viaduct over the existing railway line, between the junctions with the A47 and Crawford Street	209
Duddeston Mill Road over the existing railway line, between the junctions with Inkerman Street and Adderley Road	258
Erskine Street to the southeast of the existing railway line and Dollman Street	76
Viaduct Street adjacent to the existing railway line, to the east of the A4540 Lawley Middleway	41
St James Place between the existing railway line and the junction with Vauxhall Road	29
Lawford Close between the existing railway line and the junction with Vauxhall Road	69
Lawley Middleway south bound between the existing railway line and the junction with the B4132/Vauxhall Road	69
Lawley Middleway north bound between the existing railway line and the junction with the B4132/Vauxhall Road	180
Canal (eastern side) to the south of Curzon Street near the junction with Penn Street	39
Access Road to the south of Curzon Street near the junction with the A4540 Lawley Middleway	241
Banbury Street to the east of the Banbury Street/New Canal Street junction	77
New Canal Street to the south of the Banbury Street/New Canal Street junction	191
New Canal Street to the north of the Banbury Street/New Canal Street junction	270
Banbury Street to the west of the Banbury Street/New Canal Street junction	204
Bartholomew Street to the north of the Bartholomew Street/Fazeley Street junction	233
Fazeley Street to the west of the Bartholomew Street/Fazeley Street junction	1633
Park Street to the south of the Fazeley Street/Park Street junction	664



Description of Location	Maximum Number of Daily Users
Footpath link across park between Fazeley Street and Park Street (Park Street Gardens)	585
Footpath link across grass area between Banbury Street and Bartholomew Street	55

### *Cycle facilities*

#### **Washwood Heath and Saltley**

- 5.28.132 Approximately 1km to the south of the proposed Washwood Heath Depot site, connections are available to the Ward End cycle route. This runs from west of Castle Bromwich, close to the Chester Road junction, in the north east to Great Barr Street and then Fazeley Street in the City Centre (south west). The Ward End element of the route predominantly comprises an on road signed cycle route, although short sections of this route are traffic free.
- 5.28.133 In addition to the Ward End cycle route, there are several advisory cycle routes in the area. These include the following roads:
- Drews Lane;
  - Warren Road;
  - Aston Church Road;
  - Adderley Street (between High Street and Duddeston Mill Road)
  - Duddeston Mill Road and Vauxhall Road; and
  - Cato Street.

#### **City centre**

- 5.28.134 National Cycle Network (NCN) route 53 runs from north to south through the study area and is a traffic free cycle route. This extends through Digbeth and out towards Acocks Green in a south-easterly direction and follows the path of the Digbeth Branch and Grand Union Canals. Connections to the NCN route 53 are available from Fazeley Street and Curzon Street.
- 5.28.135 The Fazeley Street on road signed route extends from Moor Street Queensway, where a Toucan crossing is present, to the west through Liverpool Street, to Adderley Street in the south east. The route is on street and offers connections to other cycle links including the Ward End route.
- 5.28.136 Curzon Street is classified as an advisory cycle route by Birmingham CC. The advisory route on Curzon Street terminates at the Digbeth Branch Canal, where the canal tow path is identified as a route for cyclists. To the north, this route provides a link to Aston University, whilst to the south, the tow path ties into the Fazeley Street route.

5.28.137 Other advisory cycle routes in the area include:

- Woodcock Street;
- Cardigan Street;
- Milk Street;
- Oxford Street;
- New Canal Street (south of Fazeley Street); and
- Coventry Street.

5.28.138 Bus lanes are also present on Jennens Road, Moor Street Queensway and Digbeth High Street which can be used by cyclists.

### *Equestrian facilities*

5.28.139 There are no bridleways in the local area.

### **Waterways/canals**

5.28.140 To the north of the proposed Curzon Street station site is the Digbeth Branch Canal. This links with the Birmingham and Fazeley Canal at Aston Junction, to the north of the Curzon Street station site and the Grand Union Canal at Digbeth Junction or Bordesley Junction to the south east, passing beneath the route of the Proposed Scheme.

5.28.141 The Grand Union Canal and River Rea also pass through the Washwood Heath and Saltley area, crossing the path of the Proposed Scheme route just east of Saltley Viaduct for the former and west of Bromford Lane, east of Saltley Viaduct and north of Erskine Street for the latter.

### **Air transport**

5.28.142 Birmingham Airport is located to the east of Birmingham and is accessible from the city centre by bus, rail and car. Discussion of the baseline conditions for air transport is included in the assessment of the Birmingham Interchange and Chelmsley Wood CFA.